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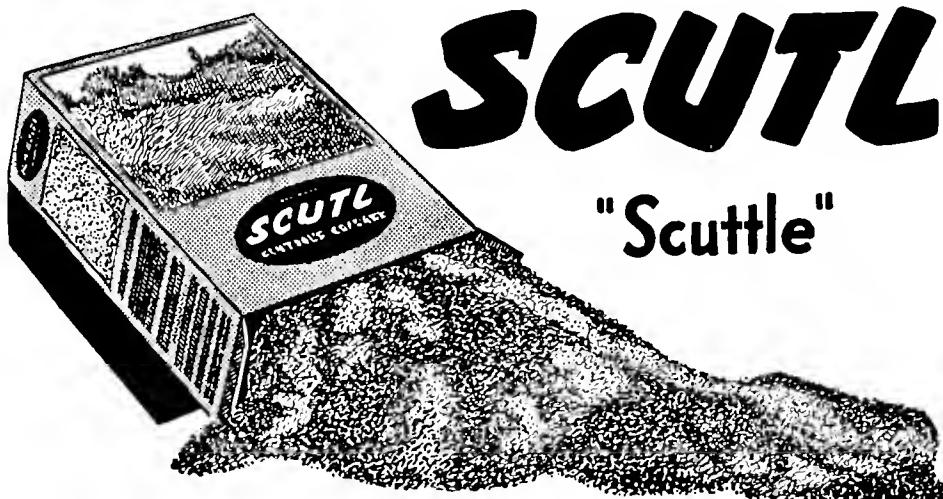
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TABLE OF CONTENTS

Spring Progress in the Arboretum	Brian O. Mulligan	1
The Rancho Santa Ana Botanic Garden	Philip A. Munz	5
William Fraser Tolmie—Meredith Gairdner Physicians, Traders, Naturalists	Mrs. O. B. Thorgrimson	7
Woodland Park Rose Garden	Adrian Gallaher	10
Mount Rainier's Wild Garden	C. Frank Brockman	12
1951 Spring Flower Show	Carol Wieting	15
Candelabra Primroses	Grace T. Dowling	17
Notes and Comment		20
Book Reviews		22
Arboretum Notebook		24

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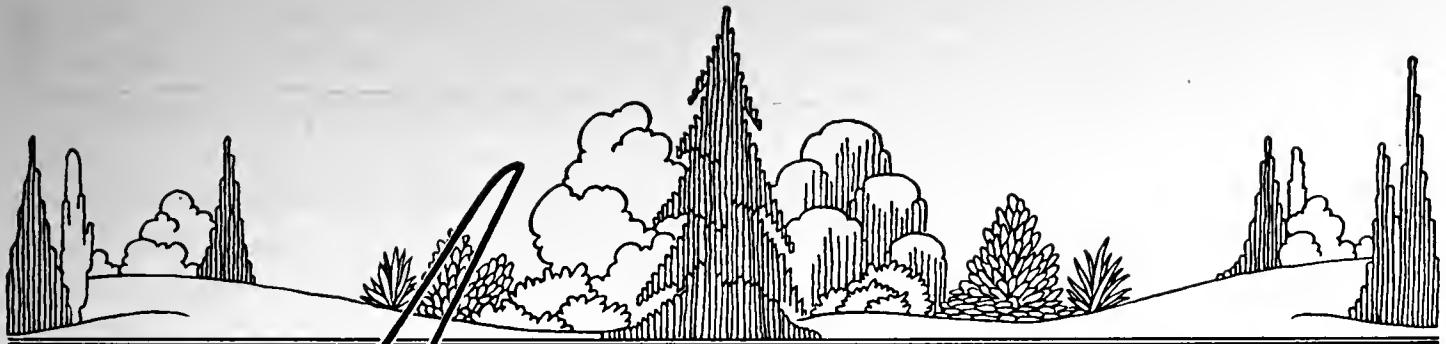
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The Arboretum Bulletin

VOLUME XIV

SUMMER, 1951

NUMBER 2

Spring Progress In the Arboretum

BRIAN O. MULLIGAN

BY FAR the most noticeable improvement accomplished in recent months has been the asphalt paving laid in March in the yard and area surrounding the offices, extending from the entrance to the greenhouse north to the new club building. This was made possible through the profits from the very successful Institute of Modern Living held on the University Campus last October, sponsored by the Arboretum Foundation. 48 cu. yards of crushed rock and almost 300 tons of asphaltic concrete were used in the process, carried out by the Washington Asphalt Co. in conjunction with the University Department of Buildings and Grounds. As a result we now possess a greatly increased and improved parking area for visitors and staff, which in due course will be partially screened by suitable plantings of shrubs.

Five new parking areas have been made along the Upper Road, from Woodland Garden southwards to a point close to the lookout and Rhododendron Glen. The frequent use of these, especially at week-ends, shows their need, and more will be made in other places when possible, especially along the Boulevard.

At three points around Rhododendron Glen steps have been made from split native cedar (*Thuja*) logs to give easier access to the planted areas, thereby eliminating at one point a steep grass bank very difficult to

mow. An important trail junction in the Glen, formerly very wet in the winter months, has been thoroughly drained, and a small new bed made on the south bank, chiefly for alpine species of Rhododendron.

Another new planting of Camellias has been made immediately south of the previous (1949) groups near Rhododendron Glen. Two others have likewise been prepared and planted north of the Glen on the east side of the Upper Road with colored forms or hybrids of the common Scotch broom; additional borders have also been formed in this area to contain various genera of shrubs belonging to the same family (*Leguminosae*). Plans for all these new beds have been prepared by Mr. Hansen, who has also made a detailed plan of all the recent Camellia plantings.

Considerable improvement to the north entrance on the Boulevard has been achieved by laying grass sod 3 ft. or more in width along the east side north of the bridge, and between Miller Street and the stone entrance pillar. The required sod was obtained from the new parking lots and beds already mentioned, sufficient being available to cover several other small areas elsewhere. At this time also the sprinkler heads along the grass margin of the northern part of the Boulevard were checked and repaired where necessary. During the last two months more than seventy reinforced concrete discs, 19 inches

wide, 2 inches thick, have been made and placed over hose connection points in grass areas throughout the Arboretum, after first lowering the projecting heads to soil level. These will allow tractor or mower to pass over them without damage to either, as has too frequently happened in the past. Like several other practical ideas this originated in the brain of the Arboretum foreman, Earl Brown, and when completed will save both hard words and mechanical damage.

Fertilizer was applied during March to most of the Rhododendron and Azalea plantings, to the Camellia collection, using cotton-seed meal, found very effective in past years, and to the crab-apple and rose species plantings in the Winkenwerder memorial area, formerly the old city dump. All young trees in the Pinetum and on Foster's Island (Pines and Birches) have had weeds cleared from around their stems and then mulched with hickory shavings. Azalea Way has been sprayed with 2-4-D for broad-leaved weeds, though other parts remain to be dealt with, and all the major areas have been sprayed with lead arsenate for tent caterpillars, more plentiful this spring than during the past three years.

The Arboretum joined with the Seattle Parks Department in setting up a large naturalistic exhibit with rocks and a waterfall across the east end of the Edmundson Pavilion at the Seattle Spring Flower Show during the first week of May, supplying a large number of Rhododendron and Azalea plants in flower, as well as Birches and Hemerocallis planted around the pool. Most of the labor was provided by the Parks Department, under the direction of Mr. Roland Koepf.

Work has continued for some time on the north bank of Woodland Garden by the Upper Road—cleaning, grading, placing logs at the base and filling behind them—and this area is now being planted with fragrant Sumac (*Rhus aromatica*), and other species.

Plantings

Somewhat less planting was achieved this spring than in previous years, due to bad

weather at the end of January and in early February, again on account of snow in early March, and finally continued dry weather in April.

To the *Rosa* collection in the Winkenwerder memorial area at the north end of the Arboretum we added 40 species or hybrids, totalling 75 kinds, and an additional five varieties of Crab-apples to those planted earlier. Early in April the initial plantings of a comprehensive collection of *Sorbus*, or mountain ashes, was set out on the eastern side of this area, comprising some 27 species and 50 plants, nearly all raised from seeds from many sources.

First plantings have also been made of the mock oranges, (*Philadelphus*), and of the related genus *Deutzia*, both in the former Army Garden, across the Upper Road from the Magnolia collection; altogether 26 plants of 13 species or hybrids have been set out according to the plans made by Mr. Hansen. More will be added to this nucleus as they become large enough in the nursery, or otherwise available.

In the new collection of colored Brooms already mentioned are 46 plants of 12 kinds; these are placed close to the Upper Road where they should form a prominent feature in succeeding springs.

A great many Rhododendrons were transplanted during February and March. Additions were made to the older groups in the *Heliolepis*, *Thomsonii* and *Triflorum* series in or near the Glen, the new small bed already noted was planted and a number of crowded hybrids on the bank near the look-out were moved to give them more space. In all some 260 plants were set out here, of about 50 species, a considerable addition to earlier plantings, and many of them large enough to flower this spring.

A new group of Rhododendrons, both species and hybrids, has been started in the tree-shaded ground immediately north of Boyer Ave., on the west side of the Boulevard, with the intention of bringing some color into this rather dark corner. Those hybrids planted during December and January

in the oak section near the north gate have for the most part flowered well this spring.

The collection of 13 kinds of heathers received in exchange in December 1950 from the Parks Department, Vancouver, B. C., have been planted on the east side of the rock garden, totalling 78 plants. On the steep and rocky west side we have set a small assortment of Yuccas, 12 plants of 6 species, whilst northwards along the same side of the Boulevard have been added several attractive young Asiatic maples of the Moosewood (*Acer pensylvanicum*) group.

On the opposite bank by the parking lot single specimens of the purple-leaved ("Crimson King") form of the Norway maple, its upright variety *ascendens*, and a similar form of the sugar maple have been placed. Three more young *Metasequoia* trees were added near those planted earlier on the bank below the Pinetum, west of the Boulevard; on the slope east of Azalea Way, near the look-out, another group of Japanese cherries has been arranged which includes several varieties new to the Arboretum, whilst six small trees of the Chinese *Liquidambar formosana* are now located close to the *Hamamelis* groups by the Upper Road.

In April we added 20 plants to the Magnolia collection, or in the adjoining Loderi Valley, some new to the Arboretum, some additions to older groups; 9 species or hybrids were represented. Others have been successfully propagated by grafting this spring, for future additions in the same area.

Acquisitions

(a) Equipment

A Merry tiller, fitted with 1½ h.p. motor, was donated in April by the Merry Mfg. Co. of Edmonds, Washington. This appears to be a useful new type of small cultivator for work in nursery rows, etc., and is light and easily handled. A considerable quantity of wood shavings was given by Rainier Ice and Cold Storage, Inc., and by Mr. Larsen from old frozen food lockers at 13th and E. Madison St., Seattle, which will be utilized for mulching purposes.

(b) Plants

Gifts have included six young hybrid Rhododendrons from Dr. J. H. Clarke of Long Beach, Washington, and the same number of some uncommon native S-E U.S.A. Azaleas from the Tacoma Rhododendron Society through Mr. L. F. Frisbie. Scions of two new maples—an upright form of *Acer nigrum*, and a natural hybrid of the sugar maple—were received from the Bureau of Parks, Rochester, New York.

Amongst purchases were plants of eleven species of Rhododendrons from the Rhododendron Fund, to add to our steadily growing collection, and the same number of colored forms or hybrids of the common Scotch broom, totalling almost 50 plants, for the new planting given by the Arboretum Unit No. 33.

The following have been bought for Woodland Garden, either for immediate planting or to grow on and plant at a later date: 450 plants of Sumacs (three species); 300 *Mahonia Aquifolium*; 300 Salal (*Gaultheria Shallon*); 50 evergreen Huckleberry (*Vaccinium ovatum*), 10 *Cornus alba sibirica*. All these, as well as the gravel for surfacing the new parking area and steps here, have again been donated by the energetic West Seattle Garden Club.

(c) Seeds

Very many collections of varying sizes have been received in exchange from other arboreta and botanic gardens throughout the world, as usual during the spring months. These have come from ten such sources on this continent, twenty-nine in Europe and elsewhere, including Scandinavia, Great Britain, Italy, Jugoslavia, New Zealand, South Africa, and Japan. Others of special note have been a consignment of native trees and shrubs from Mr. W. D. Cook's garden in North Island, N. Z., one from a famous Northern Ireland estate (Castlewellan) which included nine species of conifers, a collection of twenty kinds of Azaleas from Mrs. Farrand of Bar Harbor, Maine, and of *Platanus Wrightii*, *Yucca elata* and some other Arizona plants gathered by Mrs. T. C. Frye.

(d) Books

Amongst additions to the Arboretum library during the past few months have been "Arboretum Segrezianum," by A. Lavallee (1877); "Icones Plantarum Formosanarum," by B. Hayata (1915); "Camellias and Magnolias," and the Rhododendron Year Book, 1950, both from the Royal Horticultural Society, London; "Camellia Research," from the Southern California Camellia Society (1950); American Camellia Society Year Book, 1950; and Hegi's "Flora von Mittel-Europa," Vols. I (1906) and IV (1919).

(e) Monetary Gifts

Mr. Ceber Baillargeon again generously donated \$100.00 to enable us to buy a further nine of the older volumes of the "Botanical Magazine," which have now been received from an English bookseller.

West Seattle Garden Club recently contributed a further \$300.00 for maintenance or other work in Woodland Garden, and Seattle Garden Club \$400.00 for labor during the summer on Azalea Way.

Arboretum Unit No. 8 (Else M. Frye) has given us more than \$80.00 for various books recently ordered, whilst Unit No. 37 has provided \$25.00 for a specimen plant. For lectures given to several garden clubs or units Mr. Oliver Ester, landscape architect, has contributed the sum of \$51.90 to Arboretum funds. All such generous donations are most welcome, whether for specific purposes or not, and are very gratefully accepted.

Distributions

Consignments of seeds have been sent under the international exchange scheme to 19 other horticultural or botanical institutions in the U. S. A. and Canada, 66 in Europe, Asia and other countries. It is interesting to note that the items most in demand from our list have been Noble fir (*Abies procera*), Western Dogwood (*Cornus Nuttallii*), Dove tree (*Davida*) Avalanche Lily (*Erythronium grandiflorum*) and the true lilies. Other collections have gone by request to individuals in Great Britain, New Zealand and elsewhere who have supplied us with seeds at various times.

Of plants, the largest sending comprised 50 *Rhododendron Schlippenbachii* and 20 *R. yedoense* var. *poukhanense* to the Morton Arboretum near Chicago for a new planting. Seedlings of five kinds of conifers went to Westtown School Arboretum in Pennsylvania, and older examples of five species of pines to the University of Washington's Pack Forest at La Grande, Washington, accompanied by six vigorous young *Metasequoia* plants. Three of the latter also were given to the Seattle Parks Department.

Between September 1950 and mid-May slides of views and plants in the Arboretum have been shown on twenty-nine occasions. Some of the groups concerned have been the Women's University Club, many garden clubs, Seattle Rose Society, Greenlake P. T. A., Sedro Woolley High School, and Eatonville Lions Club.

Guided tours of garden clubs in the Arboretum have also been frequent; in April and May, up to the 19th, 24 have been made, with 9 arranged for June.

The Director is a member of the Parks Committee of the Local Affairs Division of the Seattle Chamber of Commerce, and has attended three out of the four meetings so far held.

Staff

The truck driver and a laborer employed through the winter left at the end of February. Another member of the staff was promoted to the former position and a temporary laborer hired to fill the other vacancy, for two months only. The trainee-nurseryman working in the greenhouses completed his period here at the end of May, so that we are one short in that busy department. In June 1950 we had sixteen full time men on the payroll, excluding office staff; a year later, owing to a necessary budget cut in all University departments which reduced our salaries and wages funds by approximately 6½%, it has dropped to twelve. For this reason, the large donations from two garden clubs already mentioned are especially helpful

(Continued on Page 26)

The Rancho Santa Ana Botanic Garden

PHILIP A. MUNZ*

THE Rancho Santa Ana Botanic Garden was founded in 1927 by Susanna Bixby Bryant in memory of her father John W. Bixby, a California pioneer who loved his adopted state and its native vegetation. Mrs. Bryant established the Garden on a foundation and with a Board of Trustees in 1934, for the study of the native plants of California, to preserve the native flora, to try to prevent the extermination of the rare species, and to bring together in one place as many as could there be grown, for the education of the public and for their enjoyment. Dr. Carl B. Wolf was for many years the botanist of the institution and did much to build up its collection of living plants and an herbarium. Until her death in October, 1946, Mrs. Bryant acted as the director.

The Garden has occupied a commanding site in the Santa Ana River Canyon of eastern Orange County, where it has 200 acres of hilly, almost mountainous terrain. It has had growing at a given time about 1200 species of plants. On Fridays and Saturdays in the spring season it has been open to visitors; talks have been given by various members of the staff in the Assembly Hall; and a flower show, usually with about 125 species, has been on display. Many thousands of persons have come who were interested in the native plants for use at their own homes and who sought more information as to their kinds and culture, as have numerous botany classes, garden clubs, and natural history societies.

Because of the remoteness of the above location and its comparative inaccessibility, since it is many miles from the nearest town and in the center of a 6000-acre ranch, the Board of Trustees has acquired a site in Claremont and entered into affiliation with Claremont College and the other Associated Colleges at Claremont. There the Garden will be an independent institution, maintaining its own

Board and resources, but cooperating with the Colleges in various ways. Its scientific staff will have academic status in the Graduate School of Claremont college and will co-operate with the botanists of the Colleges in a program of graduate instruction. Occupying an area of about 80 acres, the Garden at its new site has already constructed most of its nursery plant, including a cottage for the nurseryman and his family, a potting shed, aluminum lath house, metal-framed greenhouse, and a building for garages, seed-cleaning room, storage-room, etc. An administration building with about 13,000 square feet of floor space is under construction. This building will contain offices, laboratories, herbarium and library.

The herbarium of Pomona College is to be housed in the Garden Building as is the research portion of the College's botany library. The combined herbaria of the College and the Garden will be about 400,000 sheets; the combined libraries about 12,000 volumes.

At the time of writing of this article (March, 1950) transplanting of woody species to the new site is under way and trees and shrubs are also being set out from the nursery. Planting is being planned in such a way that the things usually sought by visitors will be easily accessible; wildflowers, cacti and succulents, demonstrations of hedges and ground covers, specimen plants of trees and shrubs. These will be arranged by a carefully developed plan by C. Jacques Hahn, landscape architect. An experimental or test plot of several acres will lie somewhat farther away and near the nursery. Then beyond this some 55 acres are being planted according to plant communities of the state, following a system worked out by Munz and Keck for a Flora of California which is in course of preparation. By this system the vegetation of California is divided into 28 com-

*Dr. Philip A. Munz is Director of the Botanic Garden of which he writes.

munities such as Redwood Forest, Yellow Pine Forest, Pinyon-Juniper Woodland, Oak Woodland, Valley Grassland, etc. Thus in this area, plants will be found with their associates in the wild and as these communities develop, the student will find a demonstration in miniature of the California flora, so far as it is possible to grow it in one locality. With a variety of soils the site should be admirable for this purpose.

Such a move takes time. Work has been under way since last summer. A chain link fence has been constructed around the entire area, about ten miles of pipe lines have been installed and roads and trails have been laid out in a preliminary way. Now actual planting is being carried on. Not only is this new site near to the Colleges, but it is adjacent to one of the principal highways leading from Los Angeles and the metropolitan area toward the East, so that it will be easily accessible to the general public, hence the Garden should be much more useful than it has in the past.

The research program of the Rancho Santa Ana Botanic Garden at present is concerned: (1) with the systematics and botany of the California flora and (2) with the breeding and horticultural development of the California natives. A number of projects is under way in connection with the former category, such as the preparation of a manual of California plants by P. A. Munz in collaboration with Dr. David D. Keck of New York Botanical Garden; experimental studies on speciation and phylogeny in certain groups by Dr. Verne E. Grant such as in the genus *Gilia*; studies on pollination and insect visitation by Dr. Grant; a study of the genus *Myosurus* by Miss Gloria Campbell; cytological studies in various groups by Dr. Lee W. Lenz; a study of California species of *Iris* by Dr. Lenz. In connection with a breeding program Dr. Lenz is doing much hybridizing and selecting in a wide variety of groups, attempting to improve some forms for garden use and to create others. California has an unusually rich and beautiful flora, many species of which were introduced into the trade in Europe over a

century ago, beginning with the introductions of men like David Douglas. In America these have not found the favor that they have in northwestern Europe, perhaps because in the central and eastern portions of the United States the hot summer nights seem not to be suited to Pacific Coast plants accustomed to cool nights. On the Coast itself, however, the local native plants are rapidly growing in popularity, but offer some problems inasmuch as many are accustomed to summer dormancy and cannot take the irrigation in or about a lawn. In some cases hybridization with related species from a wet summer climate provides a remedy if careful selection and roguing follow the hybridization. In other cases, natives may be somewhat leggy or one form may have better foliage and another better flowers. At any rate, there is in nature a tremendous wealth of material for the plant breeder on this Coast. Dr. Lenz has work under way with *Iris*, *Penstemon*, *Fragaria*, *Diplacus*, *Ceanothus*, *Calochortus*, *Coreopsis*, *Mimulus*, and many other genera. He has nearing completion a book on some leading California natives and their propagation and culture; this will be very profusely illustrated. Mr. P. C. Everett, Superintendent of the Garden, is completing a general compilation of the results of the twenty years of work at the Garden in seed germination, propagation and culture of some thousands of species and many thousand lots of seed. It is expected that future appointments to the staff of the Garden and of the Colleges will make possible work in Mycology and Morphology. At present the botanists at Pomona College (Dr. Benson and Dr. Phillips) are largely devoted to research in Taxonomy and Ecology.

The Garden publishes its own journal, "El Aliso," which appears usually about twice a year and contains both botanical and horticultural papers, largely the presentation of the research done by the Garden staff. This journal goes to most American universities and colleges actively interested in western botany, as well as to many individuals, aca-

(Continued on Page 29)

William Fraser Tolmie - Meredith Gairdner Physicians - Traders - Naturalists

MRS. O. B. THORGRIMSON*

THE story of the discovery and settlements of the North and Northwest portion of the North American Continent, in the eighteenth and nineteenth centuries, is one of the most romantic and adventurous known in all history. England's power and glory were never greater; her ships sailed the seven seas in search of trade and her hardy subjects penetrated the wilds of unconquered lands.

Peaceful trade in furs, untold hardships due to rigorous climate and an almost total lack of the amenities of civilization, and the bitter rivalry between English and French traders were some of the factors in this great onward press of civilization, urged on by the quest of trade and discovery. The cruel atrocities carried on against the native population by earlier conquerors, in other parts of both North and South American continents in the mad scramble for gold, was absent from the record of this more sober race.

Royal charters issued by the rulers of England of this period were the established method of trade and territorial expansion. There were, generally speaking, two types of charters; those issued to "Governors and Merchants" and those to "Governors and Adventurers." The charter of the Hudson's Bay Co., issued under the latter name, May 1670, granted truly imperial powers to the company.

It was the policy of the Hudson's Bay Co. to establish trading posts across the continent at convenient points where the Indians could bring in their furs to exchange for the white man's goods. The company showed great wisdom in choosing men of superior caliber to head these forts or trading centers. Young Dr. John McLaughlin, a Canadian doctor of Scottish descent, was sent in 1824

to the important post of Fort Vancouver, located on the Columbia near the mouth of the Willamette, as chief factor. As there was no staff physician at Vancouver, McLaughlin was obliged to care for the ill as well as to attend to his many other duties. In 1830 an epidemic of malaria fever broke out among the Indians and continued for several seasons. At the request of Dr. McLaughlin, two young Scotch doctors, Meredith Gairdner and William Fraser Tolmie were sent out to fill this need. Both were in their early twenties; both were graduates of the University of Glasgow. They were both intensely interested in botany and natural sciences and were both students of Wm. J. Hooker who later became the first director of Kew Gardens. They looked forward with great eagerness to devoting their spare time to their special hobbies.

Leaving Gravesend in September 1832 in the Company's sailing ship "Granimede" the two young men set bravely out on their journey to north-west America, by the way of Cape Horn and the Sandwich Islands, as employees of the fabulous company whose name must have stirred their youthful imaginations, "The Governors and Company of Adventurers of England, Trading into Hudson's Bay." They arrived at Fort George (Astoria) at the mouth of the Columbia May 1, 1833, nearly eight months after leaving the homeland. Three days later they reached Ft. Vancouver by canoe and reported to Dr. McLaughlin, where they found many Indians and fur trappers in need of care, so unpacked their bags and set to work immediately.

Meredith Gairdner was born in Edinburgh in 1808, the only son of Dr. Ebenezer and Harriet Gairdner. The father was a medical practitioner in Edinburgh and a lecturer at the University. Meredith graduated in Medi-

*The next in our series on Early Plant Explorers of the Pacific Northwest from the pen of our co-editor, Mrs. O. B. Thorgrimson.

cine at the age of twenty and went to Germany for further study. Gairdner and Tolmie both contracted with the Hudson's Bay Co. for a term of five years to serve in the dual role of physicians and clerks.

When they accepted this appointment, they were led to believe they would have ample time and excellent opportunity to study the natural history of the region, most of which was virgin territory to the naturalist. Tolmie was sent almost immediately to Fort Nisqually which left all the work at Fort Vancouver to Dr. Gairdner; when he was not caring for patients, he was kept busy as a clerk.

In a letter to Hooker the latter tells of one short journey into the Willamette valley, botanized earlier by David Douglas. He had hoped to climb Mt. St. Helens, then in eruption, also to study the geological formations at the Dalles and many other projects which would require absence from the Fort. A little more than two years later he left for Hawaii, having developed tuberculosis, and died March 26, 1837. A tragic end for so promising a career.

Dr. Gairdner's name has been honored in the naming of four species in the realm of nature he loved so much. Two are wild flowers, *Carum Gairdneri* H. & A., which is a false caraway found in dry open places and in thickets in various parts of the Pacific Northwest. The Indians used its sweet nutty roots as food.

Penstemon Gairdneri Hook., is a Beards tongue found in the dry regions of Washington, Oregon and Idaho.

Gairdner's Woodpecker, *Dryobates pubescens Gairdneri*, resembles but is smaller than the common Harris woodpecker. We often see the little fellow running up the apple trees in the dreary autumn and winter days. Lastly, *Salmo Gairdneri*, a group which includes the well known steel-head found in the sea and coastwise streams from Alaska to California. His studies of the life history of the salmon are still held in high esteem.

His companion, Wm. Fraser Tolmie, was born February 1812 at Inverness, Scotland.

He was educated in Edinburgh, studied medicine at the University of Glasgow, where he received the degree of M.D. in 1832. He celebrated his twenty-first birthday on his way to the Pacific Northwest. Upon his arrival at Ft. Vancouver he was sent for a brief visit to the new post at Ft. Nisqually on Puget Sound, which was in the course of being developed. Early in June 1833, one of their best hunters was seriously injured, and as he would need skilled care it was decided that Tolmie should remain.

Perhaps the most important result of his longer stay at Nisqually was that it enabled him to make an exploring and botanizing trip to Mt. Rainier. He was granted a ten-day leave and as a result of this trip has the honor of being the first white man to attempt to climb this mountain. His diary gives an interesting account of the events and hardships of this trip. He had as companions five Indians; the guide hired for the trip was paid with a blanket, another was to attend to the ammunition and the others went along in the hope of getting deer and elk. He was not able to leave until the end of August and thus encountered heavy rain and swollen streams. On September 2 and 3 he reached the summit of a peak now known as Tolmie's Peak, located at the Northwest corner of Mt. Rainier National Park. His leave of absence was very short for this type of trip and the Indians refused to go above the timber line. Tolmie's disappointment was great and it was only by stressing the need of medicinal herbs that he persuaded them to go as far as they did.

A centennial celebration was held to dedicate the Mowich or Tolmie entrance to Mt. Rainier National Park. The National Park Service constructed an entrance typical of a Hudson's Bay Post of one hundred years ago. The map of the park published by the U. S. Geological Survey shows the peak he climbed



Left to right (seated): Dr. Wm. Fraser Tolmie, Hon. Horace Douglas Lascelles and Joseph Jeffrey. Standing in doorway, Joseph W. McKay. Early 1860's.—PHOTO COURTESY PROVINCIAL ARCHIVES, VICTORIA, B. C.

and the creek flowing from it, bearing the name of Tolmie Creek.

This trip to the mountains was valuable in many respects. Being the first botanist to visit the mountain, he discovered and recorded many new plants, some of which bear his name, and many were sent to his friend Sir Wm. J. Hooker, then director of Kew Gardens. Among other plants collected were two members of the genus *Pedicularis*, and *Gentiana calycosa* Griseb., a gentian with deep blue, bell shaped flowers found growing along little streams at five thousand feet.

Bearing his name is *Carex Tolmiei* Boott., one of the sedges, though more correctly named *C. podocarpa* R. Br., *Calochortus Tolmiei* H. & A., a Mariposa lily found growing in the Northwest in moist places, shaded by grasses and shrubs. *Saxifraga Tolmiei* T. &

G., "a curious little plant looking like a cross between a *Sedum* and a *Saxifraga*"*, found along streams or on rocks high up in the mountains but sulks badly under cultivation.

Penstemon Tolmiei is "an enchanting dwarf of some four to six inches . . . displaying neat balls of dark blue flowers."**

Best of all is our choice wildling, Youth-on-Age, which grows so abundantly in our region —*Tolmiea menziesii* (Pursh) T & G. The common name refers to the bud found at the point where the heartshaped leaf joins its stalk and where it often develops into a new plant.

On this trip he also secured the skins of many birds, including that of Macgillivray's

(Continued on Page 21)

*Quotations from "Western American Alpines," by I. N. Gabrielson (Macmillan, 1932).



Woodland Park Rose Garden

ADRIAN GALLAHER*

THE Municipal Rose Garden, operated and maintained as a public service by the Seattle Park Department, had its original inception in January, 1922. At that time the Seattle Rose Society presented a plan prepared by Howard E. Andrews for the construction of a rose garden to be located in Woodland Park. In October of the same year the Board of Park Commissioners authorized construction of this garden under the direction of the Superintendent of Parks. With the active support of the Seattle Rose Society, the Lions' Club and the Park Board, this was done and the Woodland Park Rose Garden was brought into being.

The location of this garden was a very fortunate one, as the site combined the advantages of good air circulation, sunshine and a good clay loam of considerable depth well adapted to rose growing. It proved very popular with the public and was always well-maintained. However, as the years passed, new additions became more infrequent, and although the old varieties were good, little was done to keep the garden up to date. Realizing that a publicly-maintained rose garden should serve a three-fold purpose, first, landscape beauty, second, the best horticultural methods of rose growing, and third, present to the rose lover the best of the new varieties, it became apparent that this garden was falling short of rendering the best possible service to the city. In 1946 the Board of Park Commissioners were asked by All-American Rose Selections, Inc., to establish a National Test Garden in the Municipal Rose Garden and at the same time the Seattle Rose Society requested a test plot for the American Rose Society. These requests were favorably received by the Park Board. A new plan was prepared by Mr. Roland Koepf of the Seattle Park Department for the renovation of the garden, and the work was started immediately. One-half of the garden

was completed the first year and at the end of the second year the garden was completely redone. Mr. Adrian Gallaher of the Park Department was appointed as a National Judge for All-American Rose Selections, and the garden was supplied with many new roses for planting by the growers association and the Seattle Rose Society without cost to the city.

The reaction of the public to a garden of this type has been very gratifying, and all through the blooming season hundreds of people will be seen comparing the new roses and taking notes on what they would like in their own rose plots. The operation of the garden has been very successful and it is now considered one of the most beautiful rose gardens in the United States. Each year new plantings are made as the new roses are introduced and others are discarded as they are no longer listed in the catalogs. This is in accord with the belief that the best service is to show the public what can now be obtained for planting in their own yards.

Cultural methods are very simple. Fertilizing is done by the use of well-composted animal manure which is worked and reworked for a period of two years before using. This is applied after pruning in the spring and well-spaded in. This spading is carefully examined while in progress to see if the previous year's manuring has been well broken down and used up in order to avoid over-feeding. Up to the present time the use of commercial fertilizers or chemicals has not seemed necessary. Spraying is done on a rigid schedule, using a complete spray, and so far the garden has been very free of disease and insect pests. Pruning is carefully done and it is the practice to cut quite heavily, leaving only four or five canes cut to three to five buds. This produces a spreading bush at about the best height to show the roses to advantage. The garden is

(Continued on Page 27)

*Mr. A. W. Gallaher is Superintendent of Maintenance of the Department of Parks, Seattle.

The Rose Garden—Woodland Park
—PHOTO BY J. P. BOSSERT



Mount Rainier's Wild Garden

C. FRANK BROCKMAN*

HERE is an oft-repeated phrase, attributed to John Muir, to the effect that Mount Rainier is possessed of a garland of wild-flowers which completely encircles its icy dome. This statement appropriately calls attention to the colorful beauty of "The Mountain's" Hudsonian meadows; but in so doing it overlooks equal, though less spectacular, botanical interests characteristic of the lower elevations. For it is variety, as well as color and abundance of plants, that makes Mount Rainier outstanding from a floral point of view.

Figuratively speaking, Mount Rainier is an arctic island in a temperate sea. Its majestic, glacier-clad summit looms far above the lesser mountains clustered at its base. From that area, which possesses a climate not unlike that within the Arctic Circle, "The Mountain's" broad flanks sweep downward and outward to the progressively milder climatic zones of the lower elevations. Each of these "life zones," as they are called, has well defined botanical characteristics. This, coupled with the fact that Mount Rainier lies entirely west of the summit of the Cascade Range, makes the flora of this region typical of western Washington. There are relatively few plants found in that extensive area that are not represented within the borders of Mount Rainier National Park.

About 700 species of flowering plants are found within Mount Rainier National Park. In addition one finds a considerable number of ferns, as well as a host of fungi, which greatly add to local botanical interests.

Mount Rainier's floral parade usually begins at the lower elevations by late April. The earliest plants to bloom are invariably the coltsfoot or butterbur (*Petasites speciosus*) and the American yellow skunk cabbage (*Lysichitum americanum*). From this inauspicious start until late fall there is a

continual succession of floral interest, for as the season progresses, spring and summer conditions advance upward to higher elevations. For this reason it is possible to find many early spring plants in bud or in full bloom at 4,000 or 4,500 feet in midsummer—even though the same species have long since disappeared at lower levels.

Flowers of the humid transition zone—that area of deep sombre forests between the elevations of 1,600 and 3,500 feet—are less generally known by the average individual than those of the more spectacular open meadows on the higher slopes. Yet they are greater in number of species, embody considerable interest, and often striking individual beauty. Many of these may be seen along the forested trails in late May or early June, although they are at their best in early July. Included in this group are the Pacific bleeding heart (*Dicentra formosa*), red flowering currant (*Ribes sanguineum*), barber pole (*Allotropa virgata*), Indian pipe or ghost plant (*Mono-tropa uniflora*), lady slipper (*Calypso bulbosa*), Pacific trillium (*Trillium ovatum*), pink corydalis (*Corydalis Scouleri*), salal (*Gaultheria Shallon*), Oregon grape (*Mahonia nervosa*), devils club (*Oplopanax horridus*), wild lily-of-the-valley (*Maianthemum dilatatum*), starry Solomon plume (*Smilacina stellata*), twisted stalk (*Streptopus amplexifolius*), three leaf or wood anemone (*Anemone deltoidea*), wood sorrel (*Oxalis oregana*), Alaska fringe cup (*Tellima grandiflora*), and vanilla leaf or sweet-after-death (*Achlys triphylla*).

Upon the shaded forest floor of this zone one also finds the western sword fern (*Polystichum munitum*), the deer fern (*Struthiopteris spicant*), the American maidenhair (*Adiantum pedatum aleuticum*), lady fern



Mt. Rainier with Western anemone (*Anemone occidentalis*) in foreground.

—PHOTO BY C. FRANK BROCKMAN

*Prof. C. Frank Brockman, Associate Professor of Forestry at the University of Washington, is a member of the Bulletin Editorial Board.

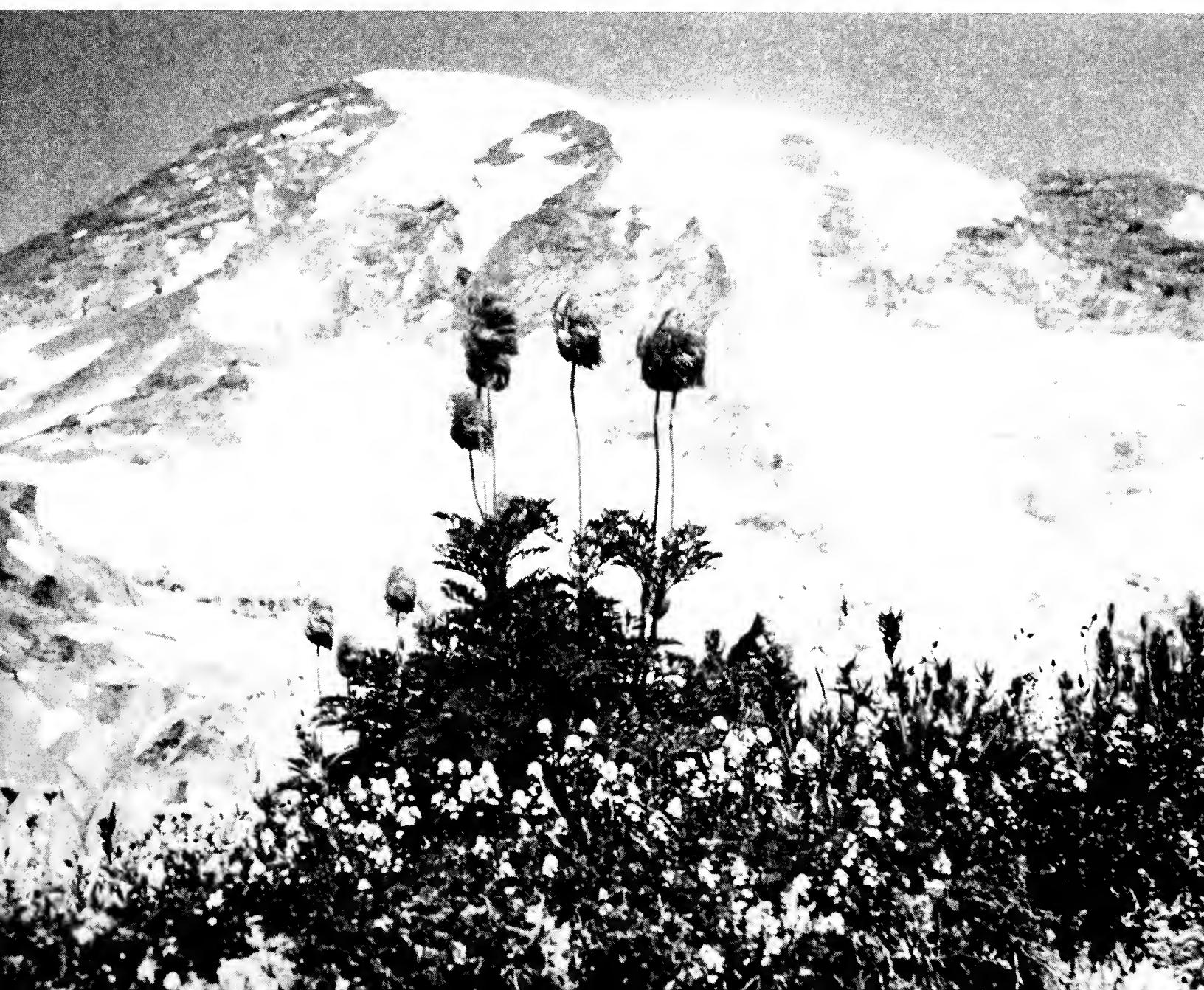
(*Athyrium Filix-femina*), mountain wood fern (*Dryopteris dilatata*), and the oak fern (*Dryopteris disjuncta*).

Progressing to higher elevations one becomes aware that the forest is less dense, the individual trees not so large and of different species. This is the Canadian zone, which lies between the elevations of 3,000 and 5,000 feet. While many of the plants of the lower elevations are found at this level—and vice versa—those that are most generally characteristic here include the Canadian dogwood or bunchberry (*Cornus canadensis*), queencup bead lily (*Clintonia uniflora*), Menzies' pipsissewa (*Chimaphila Menziesii*), Oregon wintergreen or small-leaved salal (*Gaultheria ovatifolia*), fool's huckleberry (*Menziesia ferruginea*), and the Cascades azalea (*Rhododendron albiflorum*).

The Hudsonian zone, characterized by expansive meadows enlivened by a colorful profusion of flowers during the brief summer,

lies between the elevations of 5,000 and 6,500 feet. This entire region is covered by dense snowdrifts during the greater part of the year. As a rule the first permanent snow falls about November 1st, and the earth is only partly free of its ermine blanket by early July of the following year. Thus the growing season here is short and intense.

Many of the early plants characteristic of this region become evident as soon as the snow melts. In this group are included the avalanche lily (*Erythronium montanum*), yellow dog-tooth violet (*E. grandiflorum pallidum*), and the western anemone (*Anemone occidentalis*). In addition one finds a multitude of interesting and colorful blooms such as the elks lip marsh marigold (*Caltha leptosepala*), Eschscholtz' false hellebore (*Veratrum Eschscholtzii*), bear grass (*Xerophyllum tenax*), mountain dock (*Polygonum bistortoides*), Alaska spiraea (*Lutkea pectinata*), fan leaf cinquefoil (*Potentilla flabellifolia*),

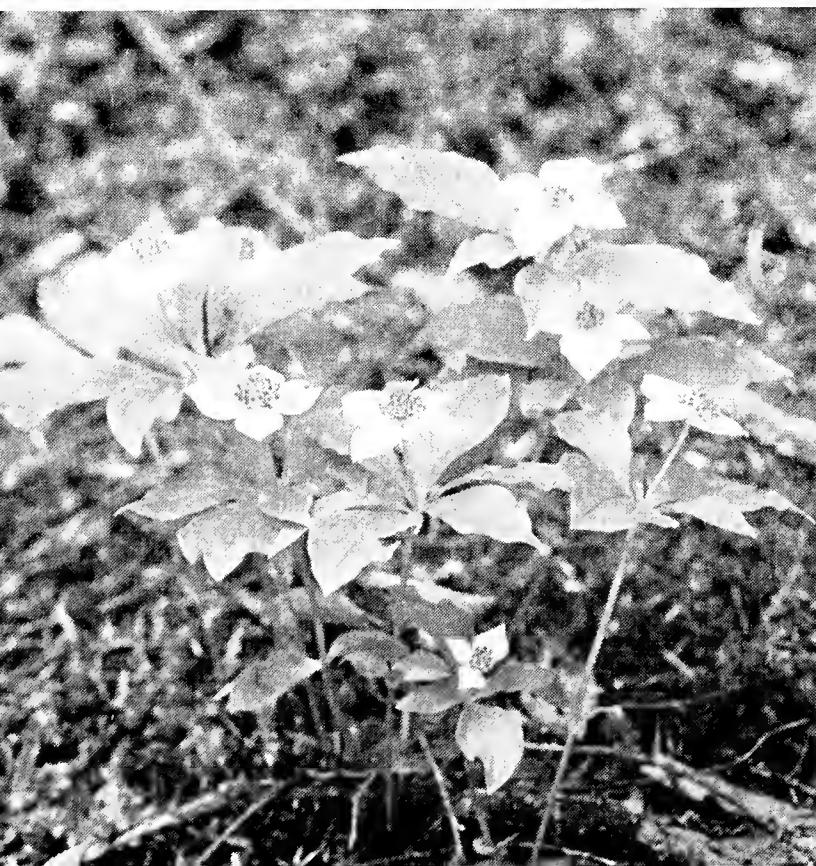


subalpine spiraea (*Spiraea densiflora*) and lupine (*Lupinus subalpinus*), white (*Cassiope Mertensiana*), red (*Phyllodoce empetriformis*) and yellow heathers (*P. glanduliflora*), delicious blueberry (*Vaccinium deliciosum*), Jeffrey's shooting star (*Dodecatheon Jeffreyi*), blue gentian (*Gentiana calycosa*), spreading phlox (*Phlox diffusa*), Jacob's ladder (*Polemonium pulcherrimum*), scarlet painted cup or Indian paintbrush (*Castilleja miniata*), magenta painted cup (*Castilleja oreopola*), Lewis' monkeyflower (*Mimulus Lewisii*), yellow mimulus (*Mimulus Tilingii*), common lousewort (*Pedicularis racemosa*), Indian warrior lousewort (*P. bracteosa*), cliff penstemon (*Penstemon rupicola*), Cusick's speedwell (*Veronica Cusickii*), Sitka valerian (*Valeriana sitchensis*), bluebell (*Campanula rotundifolia*), broadleaf arnica (*Arnica latifolia*), and aster fleabane (*Erigeron salsuginosus*).

At the upper limit of tree growth, which can be generally considered as 6,500 feet, one encounters the beginnings of the Arctic-alpine zone. Although this zone extends to the summit of Mount Rainier (14,408 feet) only the lower portions are characterized by any amount of plant life. However, a few species may be found, under proper conditions, up to 10,000 feet, and several species of mosses and lichens inhabit the rocks at

Canadian Dogwood (*Cornus canadensis*).

—PHOTO BY C. FRANK BROCKMAN



the crater rim (approximately 14,300 feet) which are warmed by vapors that escape from fissures at that point.

Among the common Arctic-alpine plants which are adapted to the extremely short growing season, the shallow and rocky soil, and rigorous growing conditions are the mountain buckwheat (*Eriogonum pyrolaeolum*), moss campion (*Silene acaulis*), willow grass (*Draba aureola*), smelowskia (*Smelowskia ovalis*), Tolmie saxifrage (*Saxifraga tolmiei*), Lyall lupine (*Lupinus lyalli*), alpine jacobsladder (*Polemonium pilosum*), Indian pink (*Castilleja angustifolia*), and gold fleabane (*Erigeron aureus*).

As every gardener knows, there are many factors other than climatic conditions that contribute to the development of plant associations. Differences in soil and moisture play a vital part in the distribution of floral interests throughout the various life zones about "The Mountain." Consequently one will find a never ending array of interests in a study of the wild plants of this region. Bogs, dry pumice flats, cliffs and rock slides, the cool depths of the shaded forests, stream borders and lake shores, meadows and alpine ridges are each—in season—decked in a colorful array of plants adapted to specific conditions.

When is the best time to view this profusion of native wild plants upon Mount Rainier? The answer to that question lies in your own particular interests, and the limitations of your available time. Late spring and early summer find the wooded areas of greatest interest. Those plants that come in the Hudsonian meadows as the snow leaves are in greatest profusion in early July. Late July and early August not only finds the Hudsonian meadows characterized by the greatest abundance of plants in the most vivid color patterns, but this period is also the best to observe many of the interesting fruits of the flowers of the deep wooded zone. Colorful Arctic-alpine gardens are also numerous in August. Even the early fall season—with its gorgeous splashes of crimson contributed by the vine maple and delicious blueberry—will reward those who visit this region at that time. Truly Mount Rainier offers us a native wild flower garden par excellence!

1951 Spring Flower Show

CAROL WIETING*

The success of the 1951 Greater Seattle Spring Flower Show can be attributed largely to the good feeling and cooperation that existed amongst the many hundreds of persons engaged in helping to put on the show. It is difficult to realize the enormous number of details that must have attention from the time when the show chairman has his original inspiration months before the actual show date until the last dustpan full of debris is cared for after the show closes. The greatest asset any such large activity can have is the group of people who work so diligently toward perfection. Included here certainly should be a list of all the contractors and their crews, all the professional horticulturalists working for both public and private interests, all the hundreds of committee chairmen and committee members, and certainly there should be included the hundreds of exhibitors, both professional and amateur, without whose help no flower show would be a success. The partnership in sponsoring the show between the University of Washington Arboretum Foundation and Greater Seattle, Inc., proved a successful one. It effectively combined the necessary horticultural know-how of the Arboretum and its associates with the equally vital ability to handle the organization and promotional aspects of the show through the office of Greater Seattle, Inc., and affiliated groups and individuals.

Perhaps the greatest single boon to the flower show was the University of Washington Pavilion where the show was held. The building with its various facilities is of course ideal for a flower show and the cooperation of the staff added greatly to its usefulness. A dirt floor of over 50,000 square feet such as the Pavilion has for the main display area means that exhibitors can have considerably

more freedom in what they can develop than they would have on a conventional wooden floor. In addition, the interior of the building is massive enough in scale to allow for construction of quite large scenes. The concourse or entrance hallways are broad enough to accommodate the more formal parts of a flower show such as flower arrangements and horticultural specimens. Even with such displays there is ample room for normal flow of foot traffic through the building.

All parts of the building were well filled with flowers in many different types of exhibits. Some of the best flower arrangement artists on the west coast exhibited their work in a special section in the concourse area. Included near these were many oriental floral arrangements. Even the junior gardeners of school age had a chance to show how well they could make miniature gardens and various flower arrangements, as well as good specimens of that controversial character the scarecrow. For the visitors who wanted to learn to make a corsage properly there was a corsage shop where the latest methods were demonstrated. As a matter of fact almost every horticultural interest imaginable was taken care of somewhere in the building. Perhaps the only things not shown were mushrooms and roof gardens. It is possible that in some future year a subterranean chamber and an elevated area may be added to display these specialties.

It was in the horticultural section that one could really see the top quality blossoms of the northwest. Here the amateur as well as the professional could show just how well they could grow one blossom, a cluster of flowers or a single plant. In size the entries ranged from tiny flowers only an inch or two high to enormous Rhododendron plants nearly ten feet high. Many awards were made in this section to well merited specimens. It was here

*Mr. Carol Weiting was one of the most diligent workers who composed the Technical Advisory Committee for the Flower Show.

that the sweepstakes award was given for a plant of *Rhododendron campylocarpum* exhibited by Mr. Donald G. Graham.

The lower floor of the pavilion held most of the garden displays erected by landscape architects, nurserymen, florists, garden clubs and flower societies. Some of the true picturesque character of the northwest, which is the actual background for so many gardens here, was developed inside the building through the use of large trees, mountain cliffs and waterfalls with pools. Several large Douglas fir trees were installed in the building. The trees varied in width from four to six feet, and approximately 55 feet in height from the floor up almost to the roof. The job of making these trees come to life again inside the building was effectively done by the staff and students of the University of Washington Department of Forestry, directed by Dean Gordon Marckworth. The stupendous mountain scene that rose for over forty feet and covered the entire east end of the pavilion was the result of the combined efforts of both the Seattle Park Department and the University of Washington Arboretum. The setting took several weeks to construct but the result was an unusually realistic mountain scene including a twenty-six-foot waterfall, tree topped cliffs, with many full grown Azaleas and Rhododendrons so large that a truck-powered hoist was necessary to put them in place.

At the opposite end of the floor was another waterfall scene banked solidly with Rhododendrons and Azaleas. Many of these were varieties that rate high on both American and British quality lists. This exhibit, installed by the Prentice Nursery and Decorating Company, won both a gold medal for first award in its class and a gold cup for the most outstanding exhibit in the show. The class in which this display was competing was for a professional grower specializing in Rhododendrons and Azaleas. Some of the other award winners in the professional classes were: Wedgwood Gardens for a planted scene of more than seven hundred square feet, Hofman Nursery and Wayne Shira a first

in the four hundred fifty foot class, Pacific Northwest Nurseries, Inc., in the three hundred foot class and Strander Evergreen Nurseries in the one hundred fifty foot group. Special awards were given to the Allied Florists of Seattle for their centerpiece display, including over eleven hundred potted Hydrangeas arranged like a piece of oriental tapestry. Another special went to the Florist's Telegraph Delivery Society, to the Beall Greenhouse Company for a large exhibit of specimen orchid plants, another to the Northwest Orchid Society, and one to the East Side Begonia Society.

A number of garden club groups staged interesting and attractive scenes. One of the most spectacular was that staged by the Seattle Garden Club featuring a modern outdoor living room with carefully chosen plant material and matching colored accessories. This exhibit was given a special award. Other garden club exhibits included intimate woodland spots, beach scenes, corners of formal gardens and some with an historical atmosphere. Amongst this group several awards were made. The Arboretum Amateurs won a cup for the most practical and usable garden with a planting of woodland plants. Other features of the lower floor included window box displays, exhibits by commercial flower shops, and trade booths where all the latest in garden gadgets could be seen.

Many people have commented on the show, mostly with praise and some with helpful criticism. It is difficult to compare flower shows one with another, because each should be different and include something new and unusual. The 1951 show certainly had that, and the 60,000 people in attendance should indicate that it was worthwhile, fulfilling its primary purpose of inspiring better plant materials and better gardens.



The Royal Azalea (*Rhododendron Schlippenbachii*) and the Korean spice viburnum (*Viburnum Carlesii*) are two of the most popular garden shrubs native to Korea.

Candelabra Primroses No. I

GRACE T. DOWLING*

THE candelabras are becoming almost as valuable to gardeners as *P. acaulis* and *P. polyanthus*. Different entirely from the last two in ease of growth, range of colors, and later season of flowering, the candelabras give a variety to the garden which is much to be desired. They are definitely without prejudices. When they grow along streams they show, by their quantities of bloom, that they are happy, but when grown near rhododendrons and azaleas in a border on the shady side of a house or in a strip of moist woodland, they excel themselves.

The general form of the plants and leaves is suggestive of polyanthus plants—big, rank and luscious foliage varying in size, quality and texture. Some leaves have dark red or pink veins, some are notched, some varieties have farina on stems or blossoms and all carry wonderful blooms in whorls about the stems. The color and height vary with the species and the time of flowering extends to give at least two months of bloom.

In various parts of Asia they grow in moist meadows where the water is always moving along, never stagnant. In cultivation they do not seem to be particular whether the soil is heavy or light if they have the moisture they have learned to depend upon; and the more moisture they have the less shade they require. They are greedy, liking rich soil, full of cow manure, compost, ashes, bonemeal, most anything they can get except too much lime. Deep cultivation is appreciated.

At the first heavy frost the leaves die down, leaving a mass of rotting vegetation which should be removed as soon as possible. Slugs and snails choose these places to lurk and plunder. Slug bait should be placed around and about to prevent the crowns from being eaten.

*Mrs. J. Thomas Dowling, editor of the Arboretum Notebook, brings us this interesting discussion on Candelabra primroses. This is the first of two articles, Part II to be published in the Fall, 1951, issue.

Some of the candelabras do not, by nature, cross easily with each other, but neither do some reproduce themselves true to type from seed, and when seed is sown many undesirable colors result. This can be avoided somewhat by collecting seeds from the center of a large planting where the bees are not as apt to bring pollen from beyond the edge of the group. It should be every gardener's solemn duty to dig up and burn every candelabra primula with muddy, dirty colors as soon as the blossom opens, otherwise the fine colors will be lost, and there will only be mediocre strains, neither worthy nor desirable. Seeds may be planted as soon as ripe and, in a mild climate, seedlings will be ready to put in permanent situations early in the fall, or the seedlings may be wintered in cold frames and not set out until they have started growth in the spring.

Somewhat contrary to conventional treatment, candelabras should be divided in the early spring. Those with more than one crown should be separated and replanted, digging in fertilizer of one kind or another before replacing. Most of the candelabras give some fall bloom and in several species a mass of bloom is produced. This adds to their value and gives the garden a quantity of color unusual at this season.

Primula japonica

In 1850 the first *P. japonica* was brought to England and it takes no great imagination to picture the furor when its blossoms were first exhibited. It came from Japan, and it has since become an essential, component part of many gardens. The colors vary remarkably and Mr. Reginald Farrer's characteristic account of *P. japonica* cannot be surpassed. "There are good golden-eyed forms and there are inferior white forms with blurred, weeping eyes, sore edged and conjunctivitic—and superb forms of hot, clear scarlet-rose, like sunlit blood, or salmon, suffused with tomato sauce." This description has many times

bolstered my irresolution when culling out the inferior plants in my planting. There are many forms frankly magenta, and for magenta haters these are absolutely taboo; there are many named varieties: "Miller's Crimson," described as "brightest and richest of all," "Rose du Barri," a good, wild-rose pink; "Postford White," whose seeds are supposed to come true. There is no reason why every grower of candelabra primulas cannot have his own favorite strain, by saving seeds of the best and diligently discarding all those that will possibly mar the color for which he is striving. It is a grand game and lends another interest to gardening.

P. japonica does not make a practice of naturally crossing with other candelabras, but from the variety of seedlings the best may be chosen and propagated vegetatively. "Sir George Thursby" (*P. japonica* x "Lissadell Hybrid") is one selected as outstanding from a large planting. It is deep wine color with a distinguishing texture to the petals and a luscious foliage.

P. japonica is definitely easy and takes no more care than any good perennial. Water, much as one gives the border plants, good food and a place where it gets some shade sums up its desires, and the color lifts the general facial expression of the June garden more than any other plant I know. There are many places where *P. japonica* may be planted to make a picture so outstanding that it dominates the entire landscape. I have in mind a garden where there is a stream arranged in falls down a slope with *P. japonica* planted "naturally" along both sides. Nothing else of consequence is allowed at just that season to mar this beauty. Early in the morning or late in the afternoon, when the sun is low and shining through the blooms of gorgeous color on stems over three feet high, it is a stunning sight. Along a shady path with a deep green background of rhododendrons or hemlocks is an advantageous location; not in a straight line, but with bays, letting the primulas run back into the trees or shrubbery. Another successful planting is in front of a wisteria vine, trained to cover a lattice or fence. The wisteria

and the *P. japonica* bloom at the same time.

There is no excuse for dullness in the June garden as long as we have a place for *P. japonica*.

Primula pulverulenta

It is a pleasant and an admittedly smug feeling to think that Mr. E. H. Wilson of the Arnold Arboretum discovered this grand plant. He tells how he found it "on the edge of cultivation" somewhere near the border between China and Tibet, a sturdy, luxuriant plant with flower stems three feet and more tall with blooms varying from pale pink to crimson. *P. pulverulenta* has the same manner of growth as *P. japonica*, long mealy stems with flowers in whorls in the candelabra fashion. The flowers are not so flauntingly ostentatious as *P. japonica* but are soft pinks and pale reds.

The arrival of *P. pulverulenta* probably did not make the original sensation of her sister, *P. japonica*, but, having proved such an important parent to hybridizers, the latter must take its place, not above, but still unquestionably near.

The typical *P. pulverulenta*, as Wilson introduced it, is rarely seen in gardens now; it has been changed and improved until, while it still retains its aristocratic style which dominates the blood of all its children, its color range is extended and its general countenance varies considerably.

No doubt the greatest improvement was made by Mr. G. H. Dalrymple of the Bartley nurseries in England. He developed the Bartley strain, a pink variety whose seeds come fairly true. "Lady Thursby," a beautiful salmon color, is considered the outstanding single variety in this strain, but all the Bartley forms are exceedingly refined.

Another strain, developed in Ireland, called "Lissadell Hybrids," a cross between *P. pulverulenta* and *P. Cockburniana*, has infused the orange-yellow of *P. Cockburniana* into the crimson of *P. pulverulenta*, making splendid shades of brilliant orange with much red in some of the colors. Two distinct plants in the Lissadell strain are called "Red Hugh," a brilliant Chinese red, and "Aileen Aroon," a more subtle color. Neither of these con-

sistently reproduce themselves exactly, so the seedlings must be watched and poor colors discarded before one's planting becomes uninteresting. The Royal Moerheim nurseries in Holland also have a charming strain, more delicate in growth and coloring than the original *P. pulverulenta*, called "Moerheim Hybrids."

It is an absorbing diversion to hybridize with *P. pulverulenta*; there is always an amateur's chance to get something outstanding, but it takes determination to throw out the poor colors as they come into bloom. Crosses of *P. pulverulenta* with *P. Beesiana*, *P. Bulleyana*, *P. Poissonii* and *P. Cockburniana* are not difficult, while a hybrid with *P. chungensis* was recorded in England in 1930.

P. pulverulenta likes the same locations and diets as *P. japonica* and will do fairly well with less moisture. The amount of fertilizer, generally well-rotted cow manure, determines to a great extent the number of whorls of bloom and the height of the stems.

The foliage is large, leaves often twelve inches long, their individuality changing with the different marriages made. A planting of two hundred or more assumes consequence in almost any situation, as the colors blend easily with others and no problem presents itself. Forget-me-nots through the beds of *P. pulverulenta* soften the austere growth and groups of ferns, in the locations they both love, are perfect.

Plenty of shade, food and moisture are all the requirements of *P. helodoxa*. The stalwart, clear green and deeply wrinkled leaves show that they require much water to develop them. The blooms, in June, near a group of *P. burmanica* or a planting of the deeper shades of *P. pulverulenta*, make different but equally charming color combinations. Even the spell of *P. japonica* is enhanced with these soft yellow whorls growing near them, if the groups are kept by themselves and not mixed haphazardly.

P. helodoxa seldom crosses with other members of the candelabra group but Mr. Dalrymple described an "orange-flowered *P. helodoxa*," a cross between *P. Bulleyana* and *P. helodoxa*, also a "cream-colored *P. helodoxa*."

A hybrid, the result of a cross between *P. helodoxa* and *P. anisodora*, has also been reported. When well established, this beautiful giant may seed itself in the garden.

It is easily grown from seeds and it is not difficult to divide when large enough. The majority of the candelabras are deciduous plants, but *P. helodoxa* is sub-evergreen, some leaves remaining on the plant all winter.

The umbel is rather distinctive. It is composed of a dozen or more blooms, the lengths of the stems varying with each flower, making graceful, loose tassels.

Primula Bulleyana

Mr. George Forrest introduced this fine primula to cultivation and named it for Mr. A. K. Bulley who made possible this particular voyage of discovery. Like many others, *P. Bulleyana* came from the primula heaven of Yunnan, S. W. China. *P. Bulleyana* is a glorious plant, like *P. japonica* and *P. pulverulenta* in growth; it differs in color. It has the candelabra style of blossom but the buds of *P. Bulleyana* are a brilliant flame color and, as the flower opens, the inside of the petals are a deep, strong, clear yellow. The upper whorls, with the flame-colored buds, and the lower whorls, with open yellow flowers, are vivid and stunningly lovely. Members of the Candelabra tribe require great numbers blossoming at the same time to get the effect of brilliance and stateliness which is due them.

This is one of the finest species in the section and should be given every opportunity to do its best. If left without dividing it deteriorates rapidly, getting a pinched look with small leaves, the whorls growing farther apart and the blossoms becoming smaller. It should be divided every second year or whenever the plants have made several crowns.

P. Bulleyana crosses readily with *P. pulverulenta* and all the rest of the candelabra, for which reason it is difficult to get seeds true to name if it is planted near others of the section. Care should be taken to keep it near those primulas which do not hybridize easily or to make large plantings where seeds from the center of the group may be collected. Then

(Continued on Page 29)

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To keep memberships in the Arboretum Foundation in good standing, dues should be paid during the month payable. Active memberships more than three months in arrears and previously established \$2 memberships more than thirty days in arrears will be dropped and THE BULLETIN will be discontinued.

Arboretum Membership Blank

<input type="checkbox"/> Active	\$ 5.00
<input type="checkbox"/> Contributing	10.00
<input type="checkbox"/> Supporting	25.00
<input type="checkbox"/> Sustaining	50.00
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The Arboretum Foundation,
University of Washington Arboretum
Seattle 5, Washington

I hereby apply for membership in the Arboretum Foundation and remittance for same is enclosed to cover dues for the next succeeding 12 months.

Name.....

Address

All memberships are non-assessable.

Notes and Comment . . .

IT was with reluctance that the many friends of Mrs. E. B. Hanley said goodbye to her recently when she left Seattle to make her home in Medford, Oregon. Certainly members of the Editorial Board of the BULLETIN, of which she has long been an enthusiastic member, were among the most regretful, for her presence at the Board meetings, always of beneficial inspiration, will be sadly missed. We are happy to report, however, that we are not to be entirely without her assistance in editorial matters as she has cheerfully agreed to promote our interests in her new surroundings and act as a Board Member at large in Oregon.

Two new members have been appointed to the Board: Mrs. Casper Clarke, The Highlands, Seattle, and Dr. C. Leo Hitchcock of the College of Botany, University of Washington.

"Puget Soundings," the Journal of the Junior League, Inc., May 1951, carries an interestingly written article by Janet Paulsen entitled "The Gentleman from Wisley." This could be none other than our Arboretum Director and co-editor of the BULLETIN, Mr. Brian O. Mulligan. An excellent picture of Mr. Mulligan accompanies the article.

We are happy to acknowledge, with appreciation of their support, the following new memberships in the Arboretum Foundation since the Winter 1950 issue.

NEW MEMBERS:

Active

Mr. & Mrs. H. Anthony	Mrs. Edward Cole
Mr. & Mrs. W. P. Bajus	Mrs. B. H. Cook
Mrs. Douglas Ball	Mrs. Frank Dunn
Mrs. Bessie Blancher	H. Duran (Brazil)
M. & Mrs. Elroy Bohlin (Hawaii)	Mrs. Carl W. Erickson
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Joseph Cassadewall (New Jersey)	Mrs. H. M. Gould, Jr.
Mrs. Raleigh Chinn	Mrs. J. Haddock
Ethel Christoffers	Mrs. Robert Halliday
Irving Clark, Jr.	Mrs. Frank Hiscock
	Mrs. Thomas J. Hocking
	Mrs. Wm. Jaquette, Jr.

Mrs. John R. Kline, Jr.	Mrs. R. A. Pederson
Mrs. J. W. Langlie	Peteris Petersons
R. E. G. Langton (Canada)	Mrs. Chester A. Potter
Mrs. Arthur Leonard	Mrs. Richard Powell
Mrs. L. L. Lewis	Mrs. Hugh Purcell
Mrs. Gordon Link	Mrs. Arthur Redman
Mrs. Bert Lockhart	Lyleton P. Rogers
Mrs. Thomas Massey	Mrs. Verne Rolfe
Mrs. I. J. McAllister	Mrs. E. W. Rukow
Mrs. Hoyt McAnally	Mrs. John W. Rumsey, Jr.
Mrs. W. J. McClure	Mrs. Sam Stocking, Jr.
Mrs. George McDowell	Mrs. Frank W. Taylor
Mrs. Mel Meadows	Mrs. James A. Tupper
Mrs. Floyd W. Miles	Mrs. Alfred Ulmer
Mrs. Ray Mines	Mrs. Joseph Valentine
Mrs. Freda Nelson	Mrs. James Walthew
Mrs. Joseph Oakley	Mrs. Jack Ward
Oregon State College	Mrs. John Wilson
Mrs. Rex Palmer	Mrs. C. M. Wiswell
R. L. Paulson	Mrs. H. C. Wolcot

Contributing

Mrs. Paul Betzold
William Cameron
Mrs. Frank Jacquot

R. C. Lenfesty
Dr. Robert Tidwell

Supporting

Harry S. Bowen

✓ ✓ ✓

William Fraser Tolmie

(Continued from Page 9)

Warbler, *Geothlypis Tolmiei* Town, a neat little olive green warbler with head, neck and breast slate gray.

After Dr. Gairdner's death he returned to Fort Vancouver as resident physician and remained there until 1841 when he visited his native land, traveling overland to the Atlantic Coast and by boat to London. While in Europe he visited France and took a post-graduate course in medicine. He remained in Europe two years, and upon his return was placed in charge of the Hudson's Bay Co. posts on Puget Sound with headquarters at Ft. Nisqually. There he remained for sixteen years, looking after the interests of the Hudson's Bay Co. and a subsidiary company, the Puget Sound Agricultural Company. He was very active in establishing farming and did much to raise the standard of cattle, horses and sheep by importing thoroughbred stock.

In 1850 Dr. Tolmie married Jane Work, daughter of John Work, a native of County Derry, Northern Ireland, then chief factor of the Hudson's Bay Co. at Victoria.

In 1846, the Oregon Boundary award gave the Americans title to what is now Oregon and Washington; as a result the headquarters of the Company were moved three years later from Ft. Vancouver to Victoria, B. C. Later, in 1859, Dr. Tolmie moved to Victoria, where he took over the management of the company and became one of the three members of the Board of Management.

Years before Dr. Tolmie had acquired a tract of eleven hundred acres near Victoria, which was known as the Cloverdale Farm, and there he lived until his death. He was a Christian gentleman, who allowed no trading on the Sabbath and had the Christian religion taught to the natives. He took an active part in the development of the northwest and made a name as ethnologist and historian and wrote articles on the history and languages of the west coast natives. He gave the vocabularies of a number of tribes to Dr. Schouler and George Gibbs, which have been published in American Ethnology.

An interesting tale is told of the discovery of coal on Vancouver Island. Upon seeing coal burned in the blacksmith's shop at Beaver Harbor, the onlooking Indians were told the coal came from across the great Salt Sea. The Indians were much amused and said the stuff was lying all about their doors. The blacksmith called Tolmie and other officers of the Fort. Word was sent to Fort Vancouver and Dr. McLaughlin ordered the "Beaver" to stop on one of her voyages to investigate, and as we all know, the coal turned out to be of excellent quality.

Dr. Tolmie's death occurred December 8, 1886, at the age of seventy-four, and a more interesting and useful life can hardly be imagined; full of hardships, but every day a challenge to the finest qualities found in the human race.

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PLEASE: Do not discard a copy of THE BULLETIN. If you have no further use for yours, pass it along to a friend or return it to the Foundation. Return postage will be guaranteed.

BOOK REVIEWS

The Lily Year Book 1950, published by the Royal Horticultural Society, Vincent Square, S. W. 1. (London, \$1.20)

I THINK that it was Ralph Waldo Emerson who said, in effect, that any book was good to read if it put the reader in a working mood. The Lily Book of the R. H. S. for 1950 is that sort of book. It makes one wish to do all sorts of work with lilies. To plant new varieties in blooming sizes, to make all sorts of crosses, since it has been found that pollen can be saved from early varieties, refrigerated, and used even on very late sorts. There is no thrill to be compared to the beholding of one's very own new variety. And the hybridizing may be very economically done, costing little more than time and patience.

That the growing of lilies has captured the interest of horticulturists of top rate in other fields is evident from the names of those participating in the deliberations of the Lily Groups.

A lecture on hybridizing was given by O. E. P. Wyatt, who calls himself an amateur. He uses none of the usual equipment deemed necessary. No "Camels hair brushes, rabbit tails, or tin boxes," to quote him. He simply carries the pollen bearing lily to the receiving one several times in the week when the stigma is most receptive, covering it so entirely that he feels that no insect would have a chance to defeat his purpose. Thereafter he labels the bloom as to parents, and without cover, allows light and air to make a healthy seed pod, the seeds from which are sown when very fresh. He displayed excellent samples of his handiwork. Crosses are many, and are apparently good. His culling out of seedlings makes one conscious of what a good lily really is. A healthy disease-resistant plant, with bloom clear in color, fragrant, and with stems that do not require staking. This is a chapter of keen interest, entertainingly related.

Ellen K. Field has made a contribution to the growing and identification of lilies by describing the bulbs, showing great differences in form and color of the many varieties, illustrating her article with excellent line drawings.

A feature each year of the Lily group is a so-called "Brain Trust" composed of four members considered experts. The panel this year was Dr. Amsler, and Messrs Constable, Coutts and Cotton. They were supposed to answer any question addressed to them. The information so derived was considerable, and most satisfactory to the questioners, who asked about all phases of culture, stressing treatments of various diseases.

There is an admirable treatise on *Liliums*, *Nomocharis* and *Notholirion*—plants not nearly enough known in America. They, too, are not difficult from seed, and are colorful, hardy, and long lived once established.

Much work on hybridization has been done by the Australian members of the Group, interesting to us in the Northwest because of the numerous crosses of *auratum* and *speciosum*. Results of similar crosses in Oregon are appearing in our Seattle market in the form of large healthy bulbs said to carry magnificent blooms.

There are discussions on time and methods of transplanting seedlings (don't disturb lilies when small), directions for scaling and growing bulbs thereby, of soils and situations, of specific varieties.

Actually there are articles so interesting and varied as to come under the heading of the auctioneer's "too numerous to mention." The illustrations are plentiful and good. Some are in color, and the range from which the photographs are taken covers most of the world.

The book closes with a review of a book by H. B. Drysdale Woodcock and William Stearn, entitled "Lilies of the World." It is a comprehensive work of 431 pages, fully illustrated, by Country Life Press, cost 32 shillings. It should make excellent reading, and be invaluable as a reference book.

So all in all the Lily Book is "good to read, as it will assuredly put the reader in a working mood."

SALLY BUNGE

"*The Coming of the Flowers*," by A. W. Anderson, Curator of the Timaru Botanical Gardens Timaru, New Zealand. Published by Williams and Norgate, 36 Gt. Russell St., London, England. American Publishers: Famer Strauss & Young, New York, N. Y. Price \$3.00.

"The Coming of the Flowers" is a delightful book telling of the origins of many of our garden flowers and the legends that surround them. It takes us back into the past and helps us to appreciate anew the wealth of plants we now possess and the means by which they were introduced into cultivation. Chapters telling of the life work of many of the plant collectors show us how much we owe these men who endured hardships, and often disappointments, to give us plants to enrich our gardens.

The book takes us to many parts of the world, Europe, China, Japan, Australia, New Zealand, North and South America, and Alaska, to the home of the plants.

Many people know vaguely the story or legend of a flower but they are not certain of its authenticity, and *The Coming of the Flowers* brings many stories to us again in an interesting way, some familiar to many people and some not well known.

How many people know the story of the popularity of the tulip in the 17th century when huge prices were paid for the bulbs and Holland was bankrupt as a result, or the story of the naming of the Marguerite? These stories and many others are told of many well known garden flowers including the Rose, Wallflower, Lily, Fuchsia, Iris, and Daffodil. Stories of the Mulberry, Hawthorn and Lebanon Cedar are also included.

Mr. Anderson, a graduate of Kew Gardens, London, England, is well qualified to deal with the subject, and he is to be commended in the research he has put into it and its presentation.

The Coming of the Flowers is a book for the bookshelf of all garden lovers.

MARGARET E. WATT

"Rhododendron Year Book," 1950—(Royal Horticultural Society, London.) Price 8/6 (\$1.20)

While the Royal Horticultural Society's Rhododendron Year Book is always welcomed by rhododendron growers, the 1950 issue is one which will be desired by all amateur gardeners whether their garden be large or small, for it has several articles which lay special emphasis on plants for the small garden and woodland plots, as well as the importance of foliage.

Two articles deal with woodland gardens: "The Woodland Gardens of Windsor Great Park," by E. H. Savill, and "Rhododendrons In a Woodland Garden in West Somerset," by Normand T. Hadden. While the first deals with a large park area, the second is confined to a two-acre plot; both give much information on suitable hybrids and species, their association with other plants and trees, their arrangement and growing requirements. Best of all, these plantings are not developed around rare and difficult plants but are made up largely of tried and true varieties with which many of us are familiar and, better still, are obtainable in this country. It is always interesting to read of an exotic garden of Asiatic plants, especially of tree varieties, many of which are of greater age than ourselves, but since most of us wish to see the results of our efforts in less time the articles included this year will give basic suggestions around which even the smallest piece of woodland can be developed.

"Dwarf Rhododendrons for a Small Garden" by C. R. Puddle, is a notable contribution to that ever increasing query about what to do with a limited area garden, with special emphasis on soil preparation and arrangement, as well as the use of larger varieties for background. Here again is the opportunity of using known and well established species, but here likewise an excellent place to grow some of the newer low growing hybrids. He also suggests the use of Lilies, Meconopsis and Primulas for interplanting. The only bad thing about his suggestions is that they make many of us somewhat ashamed of our poor arrangements, but it should inspire us to achieve some of the beauty he describes.

"Pink Pearl and Its Progeny" by Frederick Street, might well have been entitled "The Biography of a Prima Donna and her Family" for it contains many of the incidents that go into making a fascinating biography. Its questionable parentage—once closely guarded and disputed—kidnapped in early life, eventual success and stardom, and lastly, parent of a large brood of notable performers. Surely these factors smack more of adventure and romance than the study of horticulture. It makes interesting reading and gives much information of value to growers of this decorative group.

"Rhododendron Loderi and its Varieties and Hybrids" by Sir Giles Loder Bt is an appreciation of that lovely group of top flight plants and a brief history of their development since Sir Edmund Loder made the first cross in 1901. The fact that Sir Giles won the Society's Gold Medal award in 1950 for his exhibit of *Loderi* varieties is eminent proof of his knowledge of their merit.

To one who has an eye for distinction as well as beauty Mr. A. T. Johnson's "Rhodo-

dendrons As Evergreens" has touched a note too long forgotten or overlooked in the garden, namely, the value of rhododendrons as "foliage plants." Your reviewer admits a partiality to Mr. Johnson's writings but here even the casual reader will appreciate that he has pointed out beauty which should be capitalized. Those who are fortunate enough to have a few plants whose foliage is spectacular realize how frequently they are admired in the garden. *R. Williamsianum* with its bronzy heart shaped leaves is almost as lovely when not in flower. The leaf underside of "Sir Charles Lemon," *R. Falconeri*, *R. campanulatum* and many others make them well worth growing, even when flowers are poor in color. Mr. Johnson suggests only a few in the wide field which is open for study.

G. D. Grace of Portland, Oregon, contributed a splendid report on rhododendrons growing in the Pacific Northwest which is comprehensive and beautifully illustrated.

To the lover of plant exploration and adventure, especially into one of the rhododendron areas of Asia, the account of Sir Joseph Hooker's first trip to the Sikkim-Himalaya region in 1847 is not only fascinating but historically important. While this was some fifty years after the introduction of *R. arboreum* into England it resulted in the first major shipment of new rhododendron species, and many of the giant tree species in the British Isles have their origin in this exploration. It is not hard to appreciate the present size and beauty of these early introductions when we note that many of them are nearly one hundred years old. The shipments made during Dr. Hooker's stay abroad likewise mark the beginning of a new era in hybridization. The names of distinguished officials and other individuals, in both England and India, who aided in these exploration trips are justly commemorated in the names of many species common to us today.

For the plant breeder and scientist there are reports on the "Chromosome Numbers of Rhododendron Species" and "Polyploidy in The Genus Rhododendron," by Dr. Janaki Ammal and others, as well as "Observations on Bud Blast" by Frederick Street.

As usual there is the report on the 1950 Rhododendron Show, group meetings and awards, and notes of the year.

HERBERT G. IHRIG

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Most of the books reviewed in this section are in the Library at the Arboretum. Members of the Foundation may refer to them there at any time. Orders for those not easily obtained may also be placed through the Arboretum.

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Perhaps the most spectacular native Korean tree is the *Cornus Kousa* dogwood. The Arboretum has a good representation of this dogwood, the most outstanding of which are three trees located on the south slope in Rhododendron Glen. These trees are about 18 feet high, branching low to the ground, and when in full bloom (June) are studded with upright white flowers in a series of horizontal planes producing a most dramatic effect.

ARBORETUM NOTEBOOK

This department is published for correspondence and pertinent comments by experienced growers on interesting plants and their culture. We solicit your questions but space limitation necessitates the publishing of only such answers as we deem of general interest.

... Garden Notes and Hints ...

JUNE

The beginning of June still has many blooms of hybrid Rhododendrons.

The Tree Lupin, a hardy evergreen, is seldom seen in gardens but may be a valuable addition to the June border. It grows from four to seven feet high and the blooms are fragrant. The yellow and white varieties are most often grown but there are many hybrids of various colors. They come easily from seed and they like little or no lime in the soil, they can be well grown at the sunny end of the Rhododendron bed. They especially appreciate an annual dressing of manure.

In June the beautiful *Cistus* "Doris Hibberson" begins blooming. All the Rock roses (*Cistus*) like sun and dry soil.

Now the roses should be watched carefully for insects and diseases. Spray regularly, feed as blooms begin to open and on through the season. Roses need plenty of food and drink to produce fine blooms.

JULY

Cornus Kousa is the outstanding flowering tree of this month. Each branch is covered with lines of upstanding starry blooms that turn pink as they begin to fade. This tree should be a "must" for every garden, big or little.

Rhododendron Griersonianum is often in bloom in July. Its color is called "Geranium scarlet" and should be placed where blooms of pink or other reds do not detract from it.

Lavender spikes should be gathered when the blooms have reached perfection.

Cuttings of many shrubs may be taken this month. Test the growths often and when the wood snaps when bent take cuttings and insert in a close frame in equal parts of peat and sand.

AUGUST

The Fuchsias, especially the hardy varieties (Ex. *F. magellanica*) make beautiful splashes of color in August. They can be pruned to fit any position. If left unpruned they make graceful, brilliantly colored shrubs. The delicate, blush-colored "white" variety is not quite as hardy but placed in a sheltered spot it generally recovers after a stormy winter. It makes an exquisite picture covered with tiny pendant drops reminiscent of beautifully-molded crystals.

Now the perennial border needs constant attention. Watering, feeding, spraying, weeding, staking and keeping old flowers picked are important duties.

The recognition of the relationship of various Snowballs may be a stumbling block. There are two varieties, both called Guelder Rose, both with fine white balls of blossoms, both with beautiful fall coloring and both about the same

height with the same habit of growth. One variety, native to Europe, has handsome blooms and in the fall produces fine, translucent, scarlet berries. This is called *Viburnum Opulus* (European High Bush Cranberry). A form native to America and very similar to the European variety is *V. trilobum* (*Opulus var. americanum*). This American form is very decorative, beginning to color in July, keeping many of its leaves all winter as well as its berries which the birds do not eat. One variety from Northeastern Asia, called *V. Sargentii*, does not produce fruit in as great quantities as the latter. Two species from Japan, *V. Wrightii* and *V. dilatatum* are allied to *V. Opulus*. Both are medium sized shrubs and difficult to distinguish.

The common Snowball tree that our grandmothers loved and which invariably opens its blooms for Decoration Day produces no fruit and consequently is called *V. Opulus roseum* (*sterile*). All are valuable for the shrubbery border.

G. T. D.

If you want to transplant a man-size shrub, and no man available, dig a trench around it, well out from the roots, and keep the trench filled with water until you can lift the shrubs out of the soft mud, without injuring the roots. It may take several days, depending on the depth of the roots. In the meantime, dig the hole in the new location and have the proper soil at hand. When the shrub is ready to move, get it into the new location as quickly as possible, as it is fatal to let the tiny feeding-roots become dry. Wash the soil over the roots, and, while in a muddy state, lift the shrub to the proper height. It must be watered well during the first growing-season after transplanting. The writer transplanted a six-foot *Magnolia Wilsonii* the first of March, just as the leaf-buds were about to burst. It apparently doesn't know it was moved.

If you collect wildings on your trips, have a container with a tight cover in your car (an old clothes-boiler is good) and keep the roots of the plants covered with water until they are planted. They, also, should be kept watered during the first growing-season.

A good way to plant bulbs is to dig holes about a foot deeper than the bulbs are to be set. Then fill in about nine inches of sand; then a generous amount of naphthalene flakes; then three more inches of sand. Place your bulbs on the sand and cover with very rich soil. Fertilizer may be worked into the surface soil. This method seems to be unattractive to the pests and the bulbs like it.

E. D. H.

Question: How can I get rid of Fairy Ring?

Answer: Fairy rings are caused by several different fungi in the soil. It has the effect of

waterproofing the soil, so in dry periods the grass may be killed as a result. In autumn months the fungus throws up toadstools, mushrooms, or puff balls, depending on the species involved. No critical work has been done on it yet, but sulphate of iron has been recommended. Pour solution down holes made in the ring. The best method is to take out infected soil, replacing it with clean soil and laying new turf over the surface.

Question: How do I get Hydrangeas blue?

Answer: The normal color of Hydrangeas is usually pink, to keep this color feed them lime. Feed aluminum sulphate to make them turn blue, $\frac{1}{2}$ cup full around the bush, starting when buds are forming in June. Follow up in a month.

Question: My Calla Lilies seem to come up all soggy and wet, like crown rot; what should I do?

Answer: They like very wet and not necessarily too well drained areas, but must not be planted too deep, and preferably in shaded areas. One suggestion has been to pour a solution of lysol (one tablespoon to one gallon of water) over plants.

Question: How can I get rid of the destructive moles?

Answer: Trapping, poisoning by baits, and gassing are three methods. Note on moles: Moles are strictly carnivorous, eating bugs, worms, etc. It is the mice which get into the mole holes which harm the roots, bulbs, and so on, in the garden.

Question: When is the best time to plant pansy plants? Pansy seeds?

Answer: Plant the plants in the first part of September. Seeds in July.

Question: What will protect my primroses against strawberry weevil?

Answer: Get either a liquid or a dust (under various trade names) for Strawberry weevil containing Benzene-hexa-chloride. Generally, if you are not disturbing the plant, pour a solution around the base into the soil. If transplanting or planting, it is better to use a dust which can be thoroughly mixed into the soil. It is all right to dip the plant in the dust, but it is more important to mix in the soil to rid it of the grubs. This procedure will probably insure the soil against the weevil for from 2-3 years.

Question: Is the Lady Slipper a perennial? and how long will it last?

Answer: The Lady Slipper is a perennial and should continue coming up every year for many years, 10, 15 or even 20 years.

1 1 1

List of Plant Names

(Continued from Spring, 1951)

Daboecia	Irish name, St. Dabeoc's Heath	Dalbergia	for N. Dalberg, a Swedish botanist
Dacrydium	Gr. name, referring to tear-like exudations	Dalea	for Samuel Dale, English botanist
<i>dacrydioides</i>	Dacrydium-like	Dalechampia	for J. Dalechamps, Fr. savant
<i>dactylifera</i>	finger-bearing	Dalibarda	for T. F. Dalibard, Fr. botanist
<i>dactyloides</i>	finger-like	<i>dalmaticus</i>	Dalmatian
Dahlia	after Prof. Andreas Dahl, Swedish pupil of Linnaeus	<i>damascenus</i>	of Damascus
<i>dahuricus</i>	of Dahuria (Siberia)	Danae	for daughter of King Acrisius of Argus
		Daphne	Gr. name of <i>Laurus nobilis</i>
		<i>daphnoides</i>	Daphne-like
		Daphniphyllus	Gr. laurel leaf
		Darlingtonia	for Wm. Darlington of West Chester, Pa.
		Darwinia	for Dr. Erasmus Darwin
		<i>dasyacanthus</i>	thick-spined
		<i>dasyanthus</i>	thick-flowered
		<i>dasycarpus</i>	thick-fruited
		<i>dasyclados</i>	thick-branched
		Dasylirion	Gr. tufted lily
		<i>dasyphyllus</i>	thick-leaved
		<i>dasyystemon</i>	thick-stamened
		Datisca	old Gr. name
		Datura	Arabic name
		<i>daucooides</i>	Daucus-like
		Daucus	ancient Gr. name of Carrot
		Davidia	for Armand David, Fr. missionary in China
		<i>dealbatus</i>	whitened beneath
		<i>debilis</i>	weak, frail
		Decaisnea	for Joseph Decaisne, Fr. botanist
		<i>decandrus</i>	ten-stamened
		<i>decapetalus</i>	ten-petaled
		<i>decaphyllus</i>	ten-leaved
		<i>decipiens</i>	deceptive
		<i>declinatus</i>	bent downward
		Decodon	Gr. ten-toothed
		<i>decolorans</i>	discoloring, staining
		<i>decompositus</i>	decompound, more than once divided
		<i>decoratus</i>	decorative
		<i>decorus</i>	elegant
		Decumaria	Lat. tenth, referring to number of parts to flower
		<i>decumbens</i>	decumbent
		<i>decurrens</i>	decurrent, running down the stem
		<i>deflexus</i>	bent abruptly downward
		<i>deformis</i>	misshapen, deformed
		<i>dehiscens</i>	dehiscent
		<i>dejectus</i>	debased
		<i>delectus</i>	chosen
		<i>delicatissimus</i>	very delicate
		<i>delicatus</i>	delicate, tender
		<i>deliciosus</i>	delicious
		<i>delphinifolius</i>	delphinium-leaved
		Delphinium	Gr. a dolphin
		<i>deltoides</i>	triangular
		<i>demersus</i>	under water
		<i>demissus</i>	low, weak
		Dendrobium	tree and life
		<i>dendroideus</i>	tree-like
		Dendromecon	Gr. dendron, tree
		Dennstaedtia	for August Dennstedt, German botanist
		<i>densiflorus</i>	densely flowered
		<i>densifolius</i>	densely leaved
		<i>densatus</i>	dense
		<i>densus</i>	dense
		Dentaria	Lat. dens, tooth
		Derris	Gr. a leather covering

Desmanthus	flowers in bundles
Desmodium	a band or chain
<i>dentatus</i>	toothed
<i>denticulatus</i>	slightly toothed
<i>dentifera</i>	tooth-bearing
<i>dentosus</i>	toothed
<i>denudatus</i>	denuded, naked
<i>depauperatus</i>	starved, dwarfed
<i>dependens</i>	hanging down
<i>depressus</i>	depressed
<i>desertus</i>	of the desert
Desmoncus	band and hook
<i>detonsus</i>	clipped
<i>deustus</i>	burned
Deutzia	for Johann van der Deutz
<i>diabolicus</i>	diabolical
<i>diacanthus</i>	two-spined
<i>diadema</i>	diadem, crown
<i>diandrus</i>	two-stamened
<i>diantheflorus</i>	Dianthus-flowered
Dianthus	Gr. for Jove's flower
Diapensia	obscure ancient name
<i>diaphanus</i>	transparent
Diascia	Gr. to adorn
Dicentra	Gr. two-spurred
<i>dichotomus</i>	forked in pairs
<i>dichroanthus</i>	Dichroa-flowered
<i>dichrous</i>	of two colors
Dicksonia	for James Dickson, an English botanist
<i>dicoceus</i>	with two berries
Dictamnus	old Gr. name
<i>dictyophyllus</i>	netted-leaved
Dictyosperma	Gr. netted seed
<i>didymus</i>	in pairs

Dieffenbachia	for J. F. Dieffenbach, German botanist
Dierama	a funnel
Diervilla	for Dierville, Fr. surgeon
<i>difformis</i>	of differing forms
<i>diffusus</i>	diffuse, spreading
Digitalis	Lat. finger of a glove
<i>digitatus</i>	digitate, hand-like

1 1 1

Spring Progress in the Arboretum

(Continued from Page 4)

to us this year, although it will probably not be possible to maintain the standard of cleanliness and neatness throughout the Arboretum which we have tried to achieve in recent years. One man was absent for almost a month during March and April due to an operation on his hand, but has now made a satisfactory recovery.

Miscellaneous

In the four months from February through May, Mr. E. F. Marten has taken 75 black and white photographs of plants in flower or of scenes in the Arboretum, and 64 color pictures for our slide collection, which is thus

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steadily increasing and improving each year.

Telephone enquiries for information have increased from 134 in March and April 1950, to 207 during the same period this year.

The spring weather was somewhat abnormal and generally not too encouraging to our flower display. February was notable for the rainfall—8.24 inches in the Arboretum—the Seattle average for the month is 3.89 inches, but this year the city's total was 6.92 inches. On five separate days we had more than an inch of rain, and on the 8th nearly two inches (1.90), so that the ground was saturated and even overflowing in some places. March was the coldest in Seattle for 29 years, with 7½ inches of snow during the first eight days, the heaviest fall at that season since 1904. Frosts occurred in the Arboretum on 14 out of the first 19 days, the lowest temperature being 23° F. on the 6th.

April was again distinct from its predecessors; no rain fell until the 18th and only 1/10th inch in 26 days; the month's total in the Arboretum was 0.79 inches, in the city 0.52 inches, the driest since 1939. Warm and sunny conditions brought into bloom many shrubs which had been delayed whilst others were advanced to earlier flowering than usual, so that for a short time there was an unusual display; the Japanese cherries were a prominent example. However, frost of 27° and 29° F. on the 20th and 21st did considerable damage to Camellias, Azaleas, Magnolias, and some Rhododendrons and other flowers or growth shoots, even affecting the young opening leaves of the red oak trees by the Boulevard;

Rhododendron Albrechtii was particularly severely damaged, as well as *R. Schlippenbachii* in lower situations.

* * *

Woodland Park Rose Garden

(Continued from Page 10)

kept free from weeds and cultivation is constant. Mulching is not used as the constant cultivation does not allow the soil to crust or bake and so conserves irrigation water. Water is not allowed to touch foliage or blooms and is forced through the beds by sprinkling the lawn areas around them. This induces deep root growth and also keeps bloom and foliage in bright condition.

The Woodland Park Rose Garden is not a large garden in area and contains about two and one-half acres. It would not be possible to have all current varieties in a garden of this size but every effort is made to include a representative showing of the best of the new introductions. The National Test Garden is a great help. Tests are conducted over a period of two years on each entry, at the end of which the national award winning roses are selected by the scoring of the judges in the various gardens which are located in almost every climate and soil in this country. Only two or three roses of the many tested usually score high enough to receive an award and to be introduced as an All-American Rose Selection. The other test plants are then destroyed in order to prevent the introduction of inferior varieties. Such a rose may be expected to do well in any climate and has re-

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ceived the approval of the most experienced rosarians. Many test roses do well in local soils and conditions and so are introduced. The new seedlings placed in the garden for trial are the work of the best hybridizers in this country and abroad.

At the present time the garden contains about 5,000 plants. These are planted mostly in beds of twenty roses of each variety. Not many climbers can be included because of lack of space, but much remains to be done and it is to be hoped that eventually more of this desirable type of rose can be shown. Also a small area showing some of the old-fashioned roses, many of which are parents of the gorgeous hybrids so proudly exhibited today, would be very valuable.

Two years ago the Seattle Rose Society, working in conjunction with the Seattle Park Department, started a program to obtain the privilege of naming a new rose in honor of our city. This was successfully concluded, and in June of this year, as a part of the Seattle Centennial, a new rose will be given the name of "Chief Seattle." The rose selected was withdrawn from test by the introducer in order that it could be so named. It has been under close observation in the test garden and is one of the most desirable test roses to be introduced in recent years. All concerned are proud to have had a part in securing this lovely rose. Seattle has the finest rose climate in the world and all should work toward making this city what it has every right to be—the finest Rose City in America.

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The Rancho Santa Ana Botanic Garden

(Continued from Page 6)

demies of science and other institutions in this country and abroad. Exchanges are maintained with some such institutions for their journals, and subscriptions are bought for other periodicals, so that the Garden now receives almost 200 such publications. Pomona College subscribes for others. During the past few years the Garden has spent a great deal of money for books and has about doubled its library in four years; here again it has largely bought so as not to duplicate the materials in the college libraries at Claremont and to emphasize not only botany but horticulture. The result is that the combined libraries will offer a good basis for graduate instruction and for research. The Garden also possesses the Gray Herbarium Card Index, a key to the nomenclature of American plants.

It is hoped that the move to Claremont will be completed by the end of 1951 and

after that time the institution should be addressed at that place; at present its post office is Anaheim. By the spring of 1952 it is expected that the new site will be open to visitors, that help will again be available to the general public and that the Rancho Santa Ana Botanic Garden, while primarily a research institution, will be able to devote considerable time and material to graduate instruction and also to the layman who seeks information concerning the native plants of California.

Candelabra Primroses

(Continued from Page 19)

there should be very little danger of harvesting seeds which will not reproduce themselves fairly true to name.

The leaves are large, sometimes twelve inches long, with a dark red mid-rib and the flower stem reaches well over three feet when at its best.

Cheerful under the same conditions its near relatives prefer, it appreciates an occasional

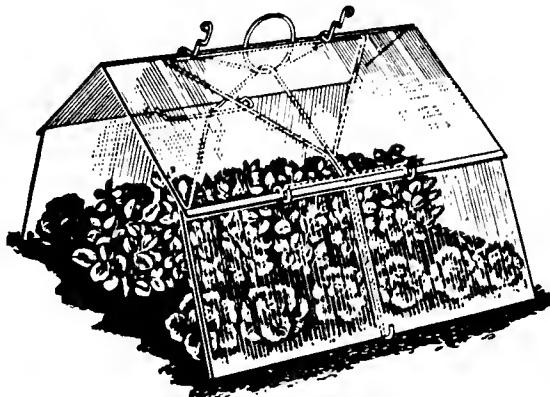
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feeding in spring and in late summer while making its roots. The big candelabras should have a feeding routine not unlike that furnished to any plant in the perennial border, but as their flowering period is short the helping need not be as generous as with plants which bloom all summer.

Primula burmanica

Reddish purple, rich red purple, rich crimson maroon, are only three of the descriptive colors given to *P. burmanica*. In spite of these elegant names it is definitely a strong brilliant magenta, a magnificent plant with lusty leaves, often a foot long, the blossoms carried in whorls, giving the same impression of opulence as the rest of the candelabra section. After the exhaustion of trying to make some primulas only endure your attentions it is a great comfort to find *P. burmanica* often flourishing under neglect. It does not mind some sun; it is indisputably a perennial; it seldom crosses with its neighbors and it is surprising how seldom it is seen in gardens. In cultivation it asks for little, much the same as the other members of the section. It produces seeds plentifully, which germinate quickly if planted as soon as ripe.

Capt. Kingdon Ward first brought *P. burmanica* from Burma with many of his fine importations.

Planted near a group of *P. sikkimensis* or *P. Florindae*, with their soft yellow colors, *P. burmanica* is striking and gratifying. I have had it planted near *P. helodoxa* and across the path from a group of Moerheim hybrids, whose delicate colors need the strength of

P. burmanica's strong magenta to balance the planting.

Primula helodoxa

Not only the "glory of the bog," according to its descriptive name, *P. helodoxa* is the glory of the garden when placed where it is satisfied and therefore well grown. It ranks high in the list of important primulas and is invaluable, not only in a bog, but along the sides of a stream, at the edge of a shady pool, in damp woodland or in any corner big enough to let its beauty develop into its natural magnificence. At its best, stalks of bloom, three to four feet tall, carry whorls of yellow blooms that are not just yellow, but with a gleam, when the sun shines on them through the trees, unlike all other yellow primulas. The whorls are somewhat farther apart than in many of the other species.

All primula enthusiasts owe the late Mr. George Forrest much gratitude for this grand plant which he and Capt. Kingdon Ward collected in Yunnan and Burma and introduced in 1913.

Primula Beesiana

The firm of Messrs. Bees Ltd. is the god-father of *P. Beesiana*, and Mr. George Forrest again was the plant collector who brought this member of the candelabra section from Asia. In itself it is not so valuable as many, for, to quote Mr. Farrer again, "it suggests a virulently magenta form of *P. japonica*." Clear magentas do not offend me but *P. Beesiana*, in its original form, is a hueless shade, neither luminous nor sparkling. However, some of its children are so beautiful one can forget the shortcomings of the parent.

The Asthore seedlings, a charming strain from Ireland, are the progeny of *P. Bulleyana* and *P. Beesiana*. The lovely variety, "Edina," also a cross between *P. Bulleyana* and *P. Beesiana*, is a bright cherry color, produced in the Royal Botanic Gardens at Edinburgh. Seeds of "Edina" practically come true to name. A sizable planting of this treasure along a shady walk is not often met, but is a marvelous addition to a primula garden.

The cultivation of *P. Beesiana* is simple. It should be given cool, rich soil in half shade

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with sufficient moisture. It is not difficult to know when there is enough moisture, as the foliage quickly shows by its quality and quantity if it is suffering. *P. Beesiana* is rather gross in growth, not to the extent that it is vulgar, but it does not have the refinement of many others of the family. It blooms in June and July.

Primula Cockburniana

A smaller member of the group, but with a wonderful color, *P. Cockburniana* must necessarily be included in every collection of Asiatic primulas. Again, this is an introduction of Mr. E. H. Wilson's and it was named for Mr. Cockburn, who pronounced his name, not as it is spelled, but as if it were spelled Co-burn. Mr. Wilson relates, in his "China, Mother of Gardens," that he first saw this treasure in a deep ravine through which rushed mountain streams.

Only about a foot high, with whorls of blooms nicely poised along the stem, it has an almost indescribable yellow color, but with a red-gold tinge that makes it more orange, more brilliant and translucent.

Unfortunately it is one of those primulas which never seem to be able to live after the effort of blossoming. Seeds are set in profusion, but only now and then a plant, much to one's surprise, lives for another year. One of the growers on Vancouver Island finds it lives longer if divided immediately after flowering, and even if it does not need dividing it should be taken up and moved to another location. I have kept a place for it in the Asiatic primula path, along an old fallen log covered with the native licorice fern. Occasionally it self sows its seeds, but unless it is treated as a biennial, the space often lacks an occupant.

Its magnificent color has intrigued hybridizers and these resulting children seem more content. "Aileen Aroon" is a hybrid between *P. Cockburniana* and *P. pulverulenta*; her color is a combination of the scarlet of *P. pulverulenta* and the yellow of *P. Cockburniana*, an intense, vibrant shade.

P. Cockburniana blooms with others of the tribe in June, but insists, more than some, upon perfect drainage, half shade and the rich, moist soil demanded by all the candelabra. The extra work to keep it in the garden is more than repaid by its beauty.

(To be continued in Fall 1951 issue)

↑ ↑ ↑

The collection of more than thirty plants of Japanese shrubby peonies given to the Arboretum in January, 1951, by the Juanita Graham Unit of the Women's Amateur Chrysanthemum Association have made excellent progress; some even flowered this spring, and the largest may be planted in the peony area this fall.

↑ ↑ ↑

The *Cistus* species and hybrids are flowering profusely this season, especially the rose-purple *C. purpureus*. A newcomer in the Arboretum collection is *C. Aguilari*, with white blooms 3 to 4 inches wide; the form *maculatus* with a maroon blotch at the base of each petal is even more striking.

↑ ↑ ↑

Several species of Primulas, raised from seeds collected in Nepal, Tibet or Bhutan, are now flowering in the upper lath house; most belong to the *Sikkimensis* group.

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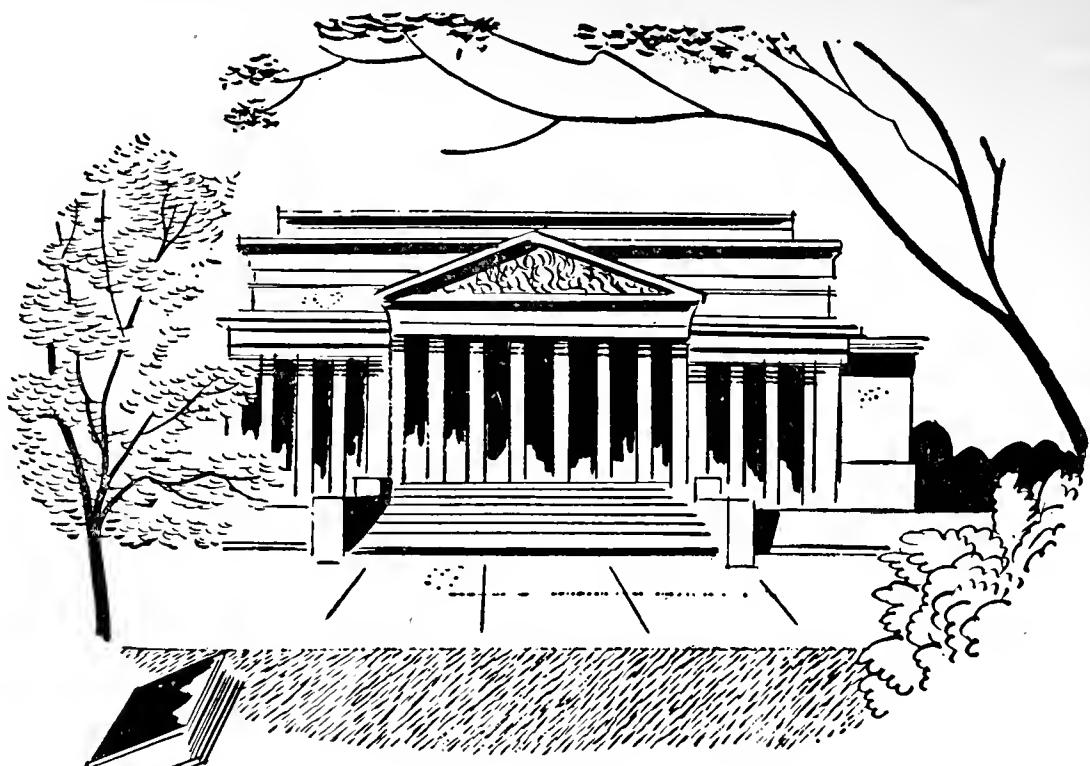
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